THE ESSENTIAL GUIDE TO EXCEL MASTERY

Excel
2022

DISCOVER ADVANCED STRATEGIES & TIPS TO MASTER DATASETS, PIVOT TABLES & CHARTS

X

With Step-by-Step Tutorials & Videos

Learn +100 SHORTCUTS & FORMULAS.

ROBERT KING

Excel 2022

The Essential Guide to Excel Mastery. Learn +100 Shortcuts & Formulas. Discover Advanced Strategies & Tips to Master Datasets, Pivot Tables & Charts | With Step-by-Step Tutorials & Videos

By
ROBERT KING

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Introduction

Mastering Excel is one of the most important decisions you can make to take your career to the next level.

But, learning Excel can be tricky at times, as the software allows you almost infinite possibilities, so navigating it could feel a bit overwhelming. That's why it's crucial for you to lay down solid foundations from the start, master the basics and learn how to use advanced strategies to reach your goals.

Hi, my name is Robert King, I am an entrepreneur and I have been a passionate Excel user since 2014. My background is in Industrial Engineering and Management Science. I have and lived in Italy and I graduated at the University of Kent with a final dissertation on linear regression techniques applied to predict growth on a set of SMEs. But I am not a statistician! My background is in business. I have been working in Digital Project Management for most of my professional career, I have also acquired a lot of experience in Digital Marketing and Online Advertising and I have been using Excel almost every day at work for a variety of tasks, such as data analytics, client reporting and presentation, automation building, Visual Basic Programming, CRM management and more.

Over time, I have started to love Excel and found out I could use it even to design mock-ups, to log my activities, keep track of my expenses and, in a few words, to organize my life.

I basically have a spreadsheet for everything, including, grocery list, with weekly and monthly quantities, prices, meal plans! I started learning Excel at the workplace, with my boss teaching me a few basic commands I needed to know for the sake of my job. But I quickly realized I had to become very proactive and start learning on my own and that has not always been easy. Sometimes. I felt I was lacking some foundations and I couldn't really progress as I wanted. Over the years, I have also combined Excel with other passions of mine, book & blog writing and software development to make Excel even faster. I love building automation to simplify people's life and save them a ton of time and I also enjoy the education space, as I love to breakdown simple concepts into bite-sized chunks that are easy to digest and assimilate.

And this is exactly how I wrote this book. This book is going to be a journey into Excel most used functions, formulas, features and much more. You will learn **how to use Excel** and become a pro, whether you need it for work or personal use, you will learn **why learning Excel is crucial** for business, **the job opportunities** you can have with high-level Excel skills, and practical examples of what you can do with Excel. This Essential Guide has everything you need to know to consider yourself an Excel Pro.

It is designed with an engineering approach to give you solid foundations from the start, covering

shortcuts, hacks, tips and tricks and much more! Moving on to Excel best practices, expert tips and advanced strategies to take your Excel knowledge to the next level. You will be able to understand the most important features and how to leverage them to create automations. You will discover advanced methodologies and small details breakdown but also the big picture and the whys.

✎ **NOTE:** Sometimes you will have to fill in the gaps! I inserted a lot of illustrations and step-by-step processes, but I also want you to open Excel and follow the examples by replicating them.

Only then, you will be able to learn. Sometimes I could have spent 2/3 pages more talking about one formula, the syntax and all the possible variations…but there are a lot of things that will be covered, arguably, someone may say that something has been even left out. Therefore, sometimes I didn't go into all the details, both not to bore you, and because you can't learn everything in one go. I prefer to give you 3 or 4 concepts and tell you how they work, so you have many more tools and you will be able to do more things. The approach is suitable for non-technical people that want to learn how to use Excel, being able to do a lot of things from the first sessions. We can geek-out more in depth in the next books ù

I now will quickly show you how you can download, install and launch Excel. **I highly recommended you to follow along** and actually mirror the content of the book. Only this way you will be able to learn and consolidate new knowledge. **It cannot be a passive learning process.**

I remember when I was studying engineering, I was spending a lot of time learning and doing exercises, and then, during the day of the test, I systematically had to solve exercises that I had really never seen before. This is because the courses were designed to make us learn and understand the concepts in depth, so the future engineers would **learn how to think**, rather than just learning by heart and writing the answer down to pass the test.

And this how what I wanted to structure book. You find will step-by-step guides and tutorials, but **you will also be required to use your brain** and you are expected to learn the concepts even if you don't see exactly all the steps laid out one by one. There is no such a thing as "learn Excel in 5 minutes". The learning will happen when you actually do the things, see error messages and troubleshoot.

When it comes to formulas, for instance, even a semi column or a bracket could cause it not to work. Nothing to worry about, that's when the learning happens.

Another thing you need to know is that in Excel there are a lot of different ways to do the same thing and achieve the same output, that's why I wanted to teach you a process and a methodology to improve your decision-making process and your troubleshooting abilities.

Moreover, Excel is a very vast software, so you won't be able to learn everything about it in one day. But I can tell you that if you manage to finish this book in under a week, and you are consistent in doing the exercises, you Excel knowledge will skyrocket. You will learn a ton of useful information and grasping new concepts from then on, will be easy and fun!

Lastly, **don't get discouraged** when things get a bit more difficult**.** Excel has hundreds of millions of users, so even if it may sound complex at times, it's designed to be mainstream and **anybody can learn it at any age**.

✎ **NOTE:** Excel can seem pretty overwhelming, especially if you are just starting. In fact, even people that consider themselves experts may lack knowledge in some areas of Excel, depending on how they use the software and for what purposes.

Perfect! Now that we established that Excel is not going anywhere, we will have a run through the carers that requires Excel proficiency, the business uses of Excel, and job titles, so you know what you are sign-up for! This book will give you the knowledge you need. It will help you both to become more employable and skilled. It will teach you methodologies to analyse data, manage spreadsheets, create pivot tables, charts, dashboards, automations and much more!

Get ready to become a spreadsheet master. Your journey starts now!

To your success,

Robert

If you enjoy video content, make sure to subscribe to our YouTube Channel.
We post tips, tricks, videos, tutorials and step-by-step guides to help you become an Excel master.

If you are already proficient with Excel and you want to try **the easiest and fastest tool to create interactive dashboards and client reports from a raw data file in Excel**, visit reportingking.com or scan the QR code below. Reporting King is the fastest Excel automation tool for charts and reports and you can try it for FREE. Our mission is to make data analytics easier and accessible to everyone, empower people with Excel knowledge and speed up their work through software and process automation

Chapter 1: What is Microsoft Excel?

What is Microsoft Excel?

Released for the first time in 1985 for Mac only, Excel is a spreadsheet software application to organize, store and analyse data. Excel is one of the most important computer programs for businesses around the world. It's the dominant standard when it comes to spreadsheets. It's flexible, constantly updating, and offers multiple solutions to support a variety of business processes.

Does learning Excel still matter?

As for today, there are **over 730,000 companies** in the world using Excel and, despite there is no official data released by Microsoft on the number of users, it is estimated that between **750 million** and **1.2 billion people** use Excel around the world. Chances are that you are one of them. Excel is considered the global standard for spreadsheets. It's integrated across the other apps within the Microsoft suite, including Power Point, Word, Teams and One Drive. It's very customisable, versatile and affordable. It's the most comprehensive solution when it comes to spreadsheets.

Most importantly, **virtually every app in the data analytics space has the option to export to Excel.**

There is a joke that is going around in Business Intelligence communities:

"What is the most used feature in any business intelligence solution?"

"It is the Export to Excel button."

This is because in Excel you can organize, clean and analyse data, create charts, visualisations and slides for presentations, key activities in many business processes, as we will see later in the book.

So, no matter what other software people use for data management, they often have to export to Excel, because they may need an extra level of customisation that only Excel can give, while other apps designed for other purposes, cannot.

Simple examples could be: changing the order of the charts, changing size, proportions, layout, colors, labels, adding functions, and more. Software created for automation have to necessarily narrow the options available. They can be great for a variety of tasks, but they may not be designed for every task that businesses need to do at any step of the data management and analytics processes. In that case, users would export to Excel and continue working. Excel can be seen as a blank canvas with unlimited customisation possibilities. That's why it may be more convenient to do part of the work with Excel, even if you use another tool as your main analytics tool. In social media marketing, for instance, I have been extensively using Excel to do client

reports, because just exporting the data from the Online Advertising Dashboards (Facebook, Google, Tik Tok…) was not enough for weekly performance meetings with clients. This is because they wanted to see data in specific ways, with tables, charts, specific metrics in a specific order (…) so we couldn't just simply get away with a screenshot from the ads dashboard and some commentary: we actually had to prepare templates and build them in a way that was simply to manage and update every week. This was for every client, every platform and every campaign.

There are software on the market to integrate, analyse and transform data, such as Tableau, Google Data Studio, Power Bi (owned by Microsoft) or Qlick Sense, among others.

You can connect these tools to multiple data sources, integrate them, create connections, create dashboards, analyse data and create presentations.

However, as mentioned, these tools don't have as many options as Excel and the same level of customisation and flexibility that Excel provides.

Learning Excel is not only important for work and business.

Learning how to use Excel means learning how to work with data, regardless if the data will be analysed with Excel or other tools.

To put it very simply:

- Every business has data, that can be collected from a different variety of sources
- Data is always organised in a spreadsheet or in table format
- Data has to be in a spreadsheet or a table to be analysed
- Data has to be processed and cleaned before starting the analysis
- In order to analyse data, you will have to learn concepts such as tables, pivot tables, charts, functions and formulas

Working with data is a process that often involves cleaning, analysing and presenting.

And those activities can be carried out with many software, but the software that allows the highest level of flexibility and customisation is Microsoft Excel. In the next chapter, I will quickly go through careers and job titles that require Excel proficiency, the activities, the business uses of Excel, and I will show how you can monetize the skills you are about to learn. And actually, any other skill that you have already!

Chapter 2: The importance of Excel in Business

Careers that require Excel proficiency (with Job Titles)

You may be wondering: what jobs use Excel? What could I do with my outstanding Excel proficiency? What could I become?

This chapter will provide you with practical information of what exactly you can do with Excel, what are the uses of Microsoft Excel in business and what are the job titles and the related tasks that involve Excel. Many of the following jobs will require an Excel test if your initial application gets accepted.

The good news is that this book is going to provide you with a great wealth of knowledge, from fundamentals to advanced techniques, tips & tricks, main formulas, shortcuts, process automation tactics, methodology and thinking.

So, once you decide where you want to take your career, all you have to do is gaining advanced Excel knowledge relating to that business area.

More importantly, if you lay down the foundations correctly, you master the fundamentals and you learn how the software works and how to think, gaining that extra knowledge will be easy and straightforward.

And this is exactly how your path to Excel proficiency has been designed.

1. **Business Analysis**

The most important use of Excel in business is Business Analysis. The process consists of gathering data and perform analysis to inform the decision makers. This generally happens on a frequent basis, whether it's daily, weekly, monthly or any other frequency. Examples of data can be sales and marketing data, website traffic, spend, insurance claims and more. Business analysts have to analyse the data and provide actional useful insights for those who run the business. Examples of this are profitability reports, social media reports showing spend, cost and performance grouped by age, gender, country, aiming at understanding how to reallocate the budget in order to reduce costs and increase profit

Job examples: business planning analyst, business solutions analyst, claims analyst, collections analyst, credit officer, data analyst, data and audience analyst, finance business analyst, investment operations portfolio analyst, junior data analyst, regional finance analyst, senior data analyst, senior finance analyst, senior portfolio analyst, business analyst, social media analyst

2. **Account Management**

Excel is widely used for account management. Managers are often required to be proficient in Excel, analyse data, make presentations, nurture the client relationships, build loyalty and repeated purchases.

Job examples: advertising manager, design studio account manager, digital account manager, junior account manager, account coordinator

3. Reporting

Reporting consists of analysing the data and putting them in a presentation for clients or stakeholders. Despite the Excel charts section is not designed for speed and design automation, the platform has a lot of design capabilities and allows you to create any type of charts for your client reports.

You can also build beautiful dashboards and interactive dashboards as we will see in the book.

Job examples: forecast analyst / sales support, performance analyst, performance analyst – procurement, professional services operations analyst, reporting analyst, reporting development analyst, sales coordinator, sales operations analyst, financial accountant

4. Strategic Analysis

Strategic Analysis refers to actions like investments, portfolio analysis and asset allocation. Analysts use formulas and spreadsheets to generate models, predict scenarios and get more support during the decision-making process.

Job examples: mergers and acquisitions valuations - analyst, membership and campaigns strategist, portfolio administration associate, portfolio analyst, portfolio associate - wealth management, portfolio management officer – asset finance, asset manager realty management division

5. People Management

One of the most common uses of Excel is building databases in a spreadsheet (the database can be seen as a table with information and data grouped in specific ways). Many companies use Excel to manage people, because storing information in a spreadsheet is particularly convenient. You can write information about people, whether they are employees, customers, supporters or others. You can write attributes, notes, and create a spreadsheet with rows and columns with all the information (such as name, surname, email address, status…). Excel allows you to easily store and retrieve information at any moment, as we will see in the book.

Job examples: client management and administration, client relationship manager, client service manager, client service specialist, employer service consultant, HR administrator, human resources administrative assistant, human resources administrator, human resources adviser, human resources officer, junior HR analyst, reconciliation and payments officer, relationship manager, client growth coordinator

6. Program Management

Excel can be used to manage programs as well. Thanks to its flexibility, people can use it to manage specific programs or projects.

It's easy to manage and can seamlessly handed over to new people in case of turnover.

Job examples: project leader, program manager, project portfolio manager

7. Operations Management

Excel can be used to manage operations as well. It's easy to use, it doesn't require code and doesn't require a high skill level. You can use it to keep track of your operations, write dates, use formulas and record all the information you need. You can update the Excel spreadsheets anytime you need (manually or via automation) and always know where you are in the process.

Job examples: data operations manager, graduate program – supply chain and operations, in market supply chain analyst, operational business analyst, operational enablement associate, operational knowledge management specialist, supply chain associate, supply chain specialist, business operations analyst

8. Office administration

Excel is often used for record-keeping, supporting day-to-day tasks, accounting, financial reporting, scheduling appointments, organizing documents, business analysis, performance reporting and more. Excel is a very useful tool in office administration, it's multipurpose and support workers during their office activities, such as paying bills, invoicing, keep client information organized.

Job examples: administration officer   administration supervisor, administrative assistant, business operations and office manager, junior clerical and administrative officer, office admin manager, office support – maintenance / general duties, administration assistant

9. Project Management

Despite companies have project management software to support their PM activities, Excel represent a valid alternative: you can use it as a database, you can create diagrams, design, add formulas, create dates and keep track of deadlines and much more. Excel very high versatility makes it a good tool for Project Management as well, easy to use and to share with other people that may not have or may not be proficient with more advanced Project Management software. Excel allows PMs to stay on top of the project and ensure everything is always on track, they can use Excel to connect and consolidate data sources across different business departments, such as resource allocation, employees work, supplier relationships, and more.

Job examples: project business analyst, project assistant / officer (IT), project analyst.

10.   Contract Administration

Excel has a lot of pre-made templates, including contract management templates. They can be used and edited to adapt to a particular contract, depending on the stage the employee is in. You can use it for these types of tasks as well, and manually build your template to organize the information as you need.

Job examples: contracts administrator, estimator / contracts administrator, graduate contracts administrator, lease administrator, quote and tender administrator, building contract administrator

11.   Sales Management

Sales manager set goals and targets and manage people. Excel represents a great solution to keep all the information organized in the same place without having high level of technical skills or a coding background (sales is a skill that traditionally doesn't require high-level computing skills, so this is another reason why it is suitable in this field as well)

Job examples: Sales Manager, Digital Sales Manager, Enterprise Sales Specialist, Senior Business Manager, Sales Executive, Business Development Manager, Regional Sales Manager, Sales Specialist

12.   Cost estimator

Excel allow to seamlessly create formulas and link them logically to understand what is going to happen if one of the parameters change. If you work in cost analysis, Excel is a very important tool to learn as it allows you to quickly setup models and analyse scenarios in a short time. Also, it's very customisable and allows to combine tables, text and charts in the same spreadsheet, which makes it very handy when it comes to keeping track of information. It's also very easy to share, making the information transfer process easy and fast.

Job examples: Cost Analyst, Cost Controller, Cost Engineer, Cost Manager, Cost Estimator, Cost Control Specialist, Senior Cost Accountant, Assistant Plant Controller, Senior Cost Analyst

13.   Accountant

Being familiar with Excel is one of the requisites when it comes to jobs in accountancy. Despite accountants may be using accountancy software for work, having at least a basic understanding of Excel is often required by employers, especially because understanding Excel means understanding datasets, spreadsheets and functions regardless in which software they are carried out.

Working as an accountant, you will have to work with financial statements, submit tax returns, manage cashflows and income statements. Excel can be used to keep track of all this info (even on a personal / organizational level) as it's very simple to use and versatile if you need to edit data or manually add information.

Job examples: Financial Accountant, Management Accountant, Junior Accountant, Chartered Accountant, Senior Accountant

14.   Economist

For those who work in finance or apply economic concepts, Excel is one of the most important tools to analyse, report and manage financial data and a must know.

Job examples: Assistant Economist, Junior Economist, Associate Consultant, Accountant, Senior Economist, Account Manager, Assistant Manager, Assistant General Manager

15.　　　Statistician

Excel allows to create, manipulate, organize datasets, use formulas, make predictive analysis and much more. Excel is definitely one of the tools you need to master if you want to become a statistician and work with numbers. As mentioned, it's considered the dominant standard for spreadsheets, so it contains everything you need to analyse your data and extract practical insights.

Job examples: Statistics Specialist, Statistician, Statistical Analyst, Senior Statistician, Statistical Consultant, Senior Data Scientist, Senior Data Analyst, Research Assistant

16.　　　Market Research Analyst

Excel provides a framework to quickly import / copy-paste / clean and format virtually any data. Market analysts use excel to analyse survey or dataset and prepare the data for further analysis or synthetise them to produce insights and learning.

Job examples: Market Research Assistant Marketing Assistant, Assistant Account Executive, Market Research Consultant, Market Research Interviewer, Market Research, Associate Market Research Executive, Market Research Director

17.　　　Retail management

Excel can be easily used in retail management to keep track of information that would be otherwise disconnected and stored in different software or directories. You can create an Excel sheet and keep track of expenses, costs, employees, payments, holidays, sick days, leaves, sales, inventory and much more. Excel provides a sort of white canvas where you can easily build your database according to your needs. When it comes to retail, you can also use Excel to manage product information (for instance in the ecommerce space) or download data from your website (export to Excel) and analyse it to better understand your performance, reduce returns, increase profits and much more.

Job examples: Retail Specialist, Retail Manager, Retail Sales Specialist, Assistant Manager, Sales Assistant, Retail Assistant, Retail Store Manager

18.　　　Quality Analyst

Whether it's quantitative analysis (based on numbers) or qualitative (based on non-numerical data that need interpretation), Excel provides a great framework to store and analyse data, measure, interpret, analyse and decipher.

Job examples: Quality Assurance Specialist, Quality Assurance Manager, Quality Specialist, Quality Engineer, Senior Quality Control Analyst, Quality Assurance Analyst, Quality Analyst, Quality Control Engineer, Quality Control Inspector, Senior Quality Assurance Specialist, Quality Assurance Engineer

19.   Self-employed / Freelancer / Contractor / Digital Nomad / Remote

Excel skills are highly monetizable and, once you become proficient, this can allow you to work remotely, on your own terms, whether it's on fixed term contracts, retainers, large project, or small gigs.

There are a lot of platforms for freelancers where you can start generating money with your what you know, but the best one is undoubtedly Fiverr, the largest marketplace where you can setup your portfolio and sell your skills. On Fiverr there are a lot of freelancers skilled in Excel (analytics, reporting, dashboards, automation, which can be also adapted to different niches), but also in other fields like social media marketing, strategy, accountancy, design, photography (….). Once you define your skills, you can create your portfolio and sell your gigs. You can apply for jobs that have been posted and get potential customers to reach out to you to enquiry about your services.

It's very fast to setup, designed for fast and efficient client-communication and can allow you to monetize your skills from anywhere, on your own terms. It's usually the starting point for more freelancers and people that want to get out of the corporate world and start creating side incomes. I used to work on Fiverr quite a lot in the past, and I also bought a lot of services for my projects from other freelancers.

Take a look at the Fiverr marketplace and sign-up to create an account. It's absolutely 100% FREE, and you can start typing in Excel related keywords (**or other keywords, if you already have skills, passions, things you are good at, you can start monetizing them very fast**) get inspiration and ideas on what skills you can sell and how to better package them to attract more offers.

fiverr.

Excel

Graphics & Des   dio

excel

excel **data entry**

excel **dashboard**

excel **formula**

convert pdf to excel

excel **macro**

excel **automation**

excel **invoice**

Search usernames containing "excel"

Search how other freelancers are already using Fiverr to make money, and get an idea of what they are doing. If you are interested in working remotely and generate another stream of income, I would recommend it to you. (Make sure you explore all the niches)

Get started with Fiver here, sign-up for free

- Link if you are reading this from Kindle**: http://www.fiverr.com/s2/445c5570b3**
- QR code if you are reading the paperback version of the book

Versions of Excel

Since its release in 1985, there have been more than 30 versions of Excel.

Nowadays, the majority of the users have Excel 2016, 2019, 2021 or Excel 365.

✏ **NOTE:** each version of Excel is slightly different from the others. Also, within each version, there are difference between the Mac and the Windows version as well. This means that some functions may be available in some versions but not in others, so as the interface may look different, and the options available like shortcuts, tabs and so on may differ from one version to another. There may be things that you will be able to do and things you may not, that's why we will focus on the approach to solve problems, and find different ways to work around the problem based on the version of Excel you have. And be creative! Make sure you know what version you are working on, so you can better understand what you can do and what you can't do when searching online. If you have already installed Excel, click on the top left corner, click on **Excel > About Microsoft Excel**.

You will be shown a prompt with your information and the version of Excel you are using. (I am using Excel 2019, just depending on the last version that was available when I purchased the software)
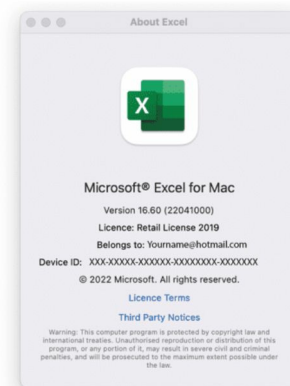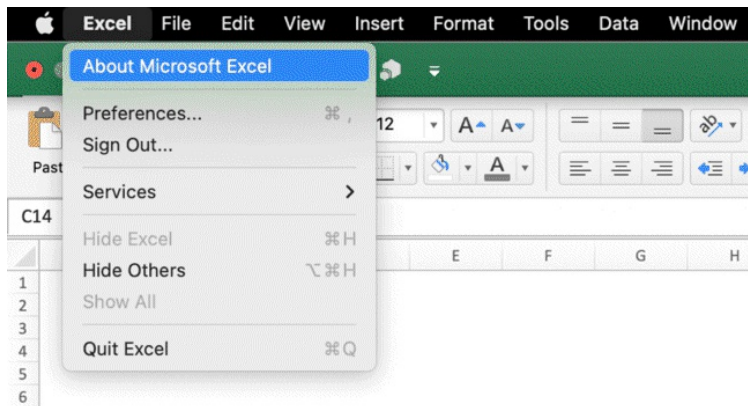
Troubleshooting and finding workaround is going to be part of the equation during your entire Excel journey, so some level of flexibility is required.

You are about learn the Excel must-know features, using commands that would more likely work across most of the Excel versions. Let's get started!

How do I get started with Excel?

Excel is a spreadsheet software that works on your computer and you don't have to be connected online in order to use it. In order to get started with Excel you have to purchase a licence, download the software, install and launch.

How to get better with Excel

Excel may feel a bit complex at times, given the vast number of possibilities and options it offers.

But you will never need to know the entire software inside out.

Which would be incredibly remarkable and unique.

It's important you understand why you need Excel for (what job you want to apply for, needs you may have when it comes to organising or analysing data), focus on those functions, processes, shortcuts that you need for your purpose. And build from there.

Second: **the more you will use Excel, the more you will learn**. Don't get discouraged if you don't know how to do something: **being constantly learning is part of the process**, especially when it comes to learning a software as elaborate and multi-layered as Excel.

Third: watch tutorials, videos and documents. Microsoft partly relies on advocates, influencers, specialists that keep constantly pushing out tutorials, exercises, tips & tricks on their blogs, platforms and channels, with more in-depth explanations than the official documentation.

This will help you dispel your doubts better than the official documentation in many cases.

You can find the official Microsoft Excel knowledge base here:

https://support.microsoft.com/en-us/excel. You may want to bookmark this link and checking it as a starting point every time you have questions.

Fourth: understand the foundations, and try! Make mistakes, troubleshoot them, and learn!

Fifth: get your Excel file open and get ready to replicate the steps I am going to show you: you can't learn passively; you actually have to do it.

Let's go!

Chapter 3: Start Using Excel

How to download Excel

You can get download Excel at this link: https://www.microsoft.com/en-us/microsoft-365/excel

Or, from your laptop, go to Microsoft.com and click on Excel.

Click on Buy now and select the option that best suits your needs.
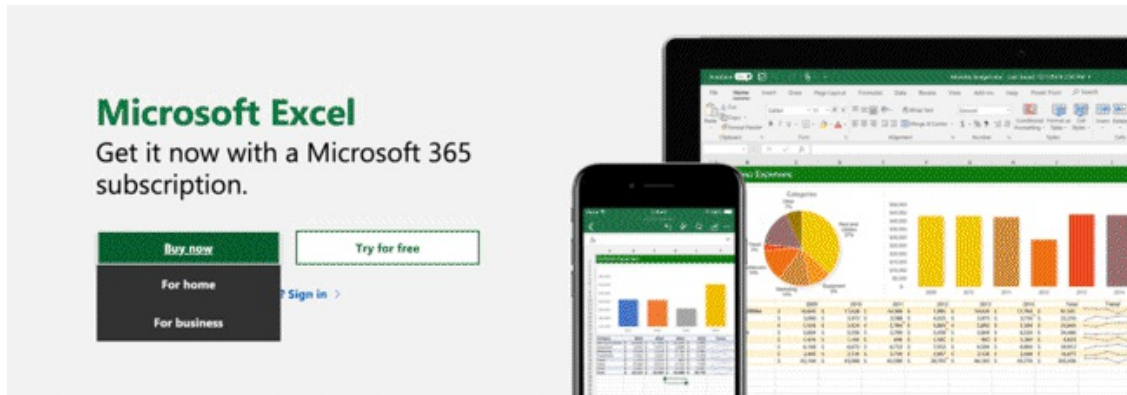
You can buy a multiple license and share it with your friends or you can buy one single license and decide to pay it monthly or yearly and save 16%.

You can also start a FREE trial for a month in case you don't want to spend any money during the initial phase and try the software more freely. If you download Office 365, your version of Excel will work from desktop, mobile and web. By downloading Office 365 you will also have access to the other software withing the Office Business Suite across different devices and operation systems.

How to install Excel

Once you have decided which plan you want to go for, go ahead and purchase the licence, download Excel and install it. The installation process follows the standard workflow and we will not cover it in depth here. Once the installation process is complete, double click on the Excel icon and launch it.

How to get started

Double click on the Excel icon to launch the program.

Microsoft Excel

This will open a new blank Excel File, where we will be working.
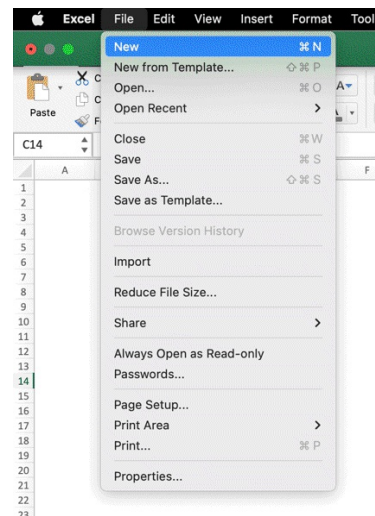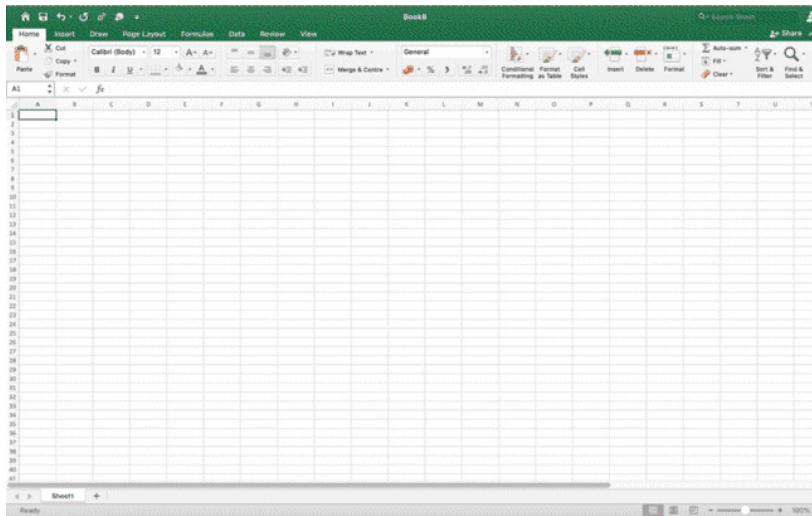
As you can see on the right, when clicking on File on the top left corner of the screen, you will be able to **save, name, and open, close** your workbooks anytime you need.

We are in!

Chapter 4: Excel Basics and Fundamentals

Excel definitions

WORKBOOK: a Workbook is an **Excel File** containing one or more Spreadsheets.

SPREADSHEET: a Spreadsheet (also named Worksheet or Excel Sheet) is a sheet made of rows and columns that you can use to input data, sort and organize it and make calculation. Rows are labelled with numbers, from 0 to 1,048,576, while columns are labelled with letters from A to Z and then, after the letter Z, they are labelled with 2 letters (starting from AA to the final column XFD with over 16,000 columns).
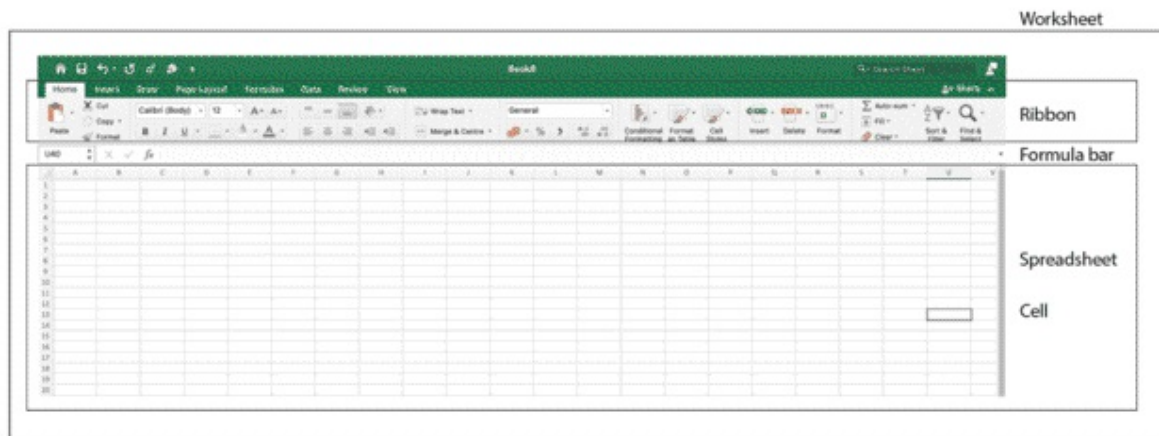
RIBBON: the Ribbon is the grey section between the Spreadsheet area and the green formula bar of the screen. It contains a lot of options to work on your data and we will learn more about it during the course of the book.

CELL: a cell is the smallest editable unit contained in a Spreadsheet. It's the intersection of a column and a row. In the picture above, we can see cell A1 selected. The selected Cell Reference is shown in the box right above.

Excel is a Spreadsheet Software, that allows you to create Workbooks (Excel files), which are collections of Spreadsheets (Worksheets), single individual sheets where you will actually do the work. Other examples of Spreadsheet Software are Google Sheets, iWorkNumbers and Open Office. They all allow you to create files that include sheets to organize data and calculate numerical values.

Excel basics

Once you launch Excel, you are presented with a blank workbook.

Let's have a look at a few shortcuts and commands to manage the file. Make sure you follow along so it will be easier for you to learn and memorize.

QUESTION: How do you open a blank new workbook in Excel?

✂ **SHORTCUT:** CTRL + N

⏱ **MANUAL:** Click on File > New

QUESTION: How do you open existing workbook in Excel?

✂ **SHORTCUT:** CTRL + O

⏱ **MANUAL:** Click on File > Open > Select the file you want to open

QUESTION: How do you save a workbook in Excel?

✂ **SHORTCUT:** CTRL + S

⏱ **MANUAL:** Click on File > Save

⏱ **MANUAL:** Click on the Save Icon on the upper left corner of the screen

Name your file and select the format. Depending on what you want to achieve you may want to choose a different format. I personally choose between .XLS .XLSX or .CSV format. Please note that if you change your file format while saving you may experience data loss, so make sure you select one of the standard formats unless you are given different instructions or you need to work with VBA (Visual Basic for Applications). In that case you would select Macro Enabled Workbook .xlsm.

QUESTION: How do you close a workbook in Excel?

✂ **SHORTCUT:** CTRL + W

⏱ **MANUAL:** Click on File > Close

QUESTION: How do you add new worksheets in the workbook?

ANSWER: Once you create a Workbook, you will start working on Sheet 1, which is created by default.

Simply click on the + sign near Sheet 1 on the bottom and new Sheets will be automatically added. You can add up to 255 sheets before saving your file and even more afterwards, depending on how much space you have in the destination folder. You will not need all those sheets for the moment
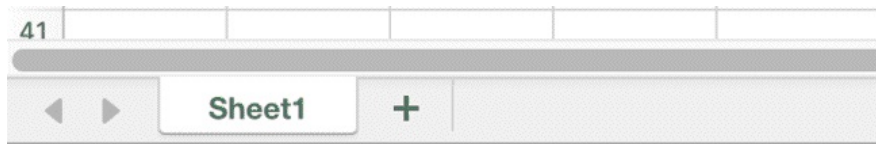

QUESTION: How do you edit or remove worksheets?

ANSWER: Double click on Sheet 1 (or any other Sheet) to change the name

Right click on Sheet 1 (or any other Sheet) to display the full list of options, such as renaming, hiding / unhiding, duplicating, protecting, delete, change color and more.
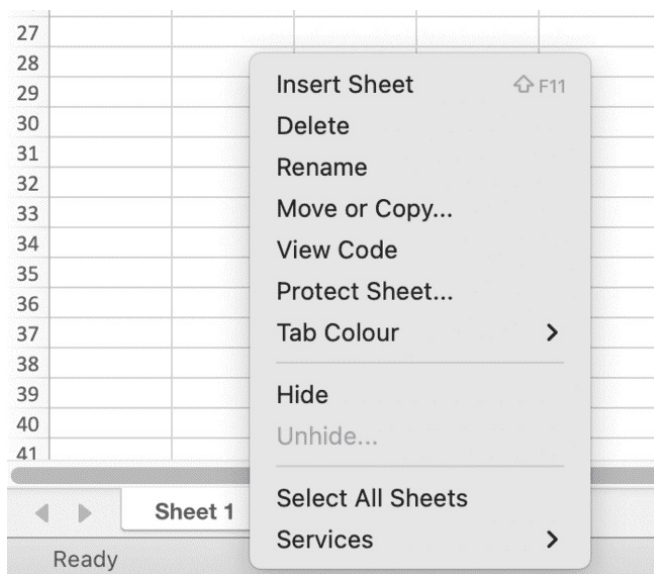
Now that you are familiar with the Worksheet basics, let's see how Excel actually works.

Place your mouse pointer on a cell and click. You will see the cell border becoming green (showing the cell is selected) and the address of the selected cell displayed on the top left corner. B2 is now the "active cell', as it's currently selected. B is the column index, 2 is the row index. These, combined, are called "cell reference".
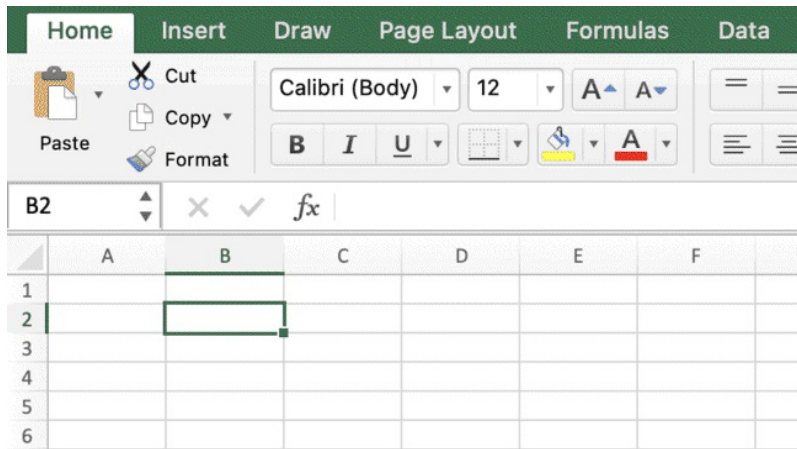
Once the cell is selected there are several ways to input values within it

1. Just start typing over numbers or text and press enter when you are done
2. Click on the formula bar, start typing numbers or text there, and press enter once you are done
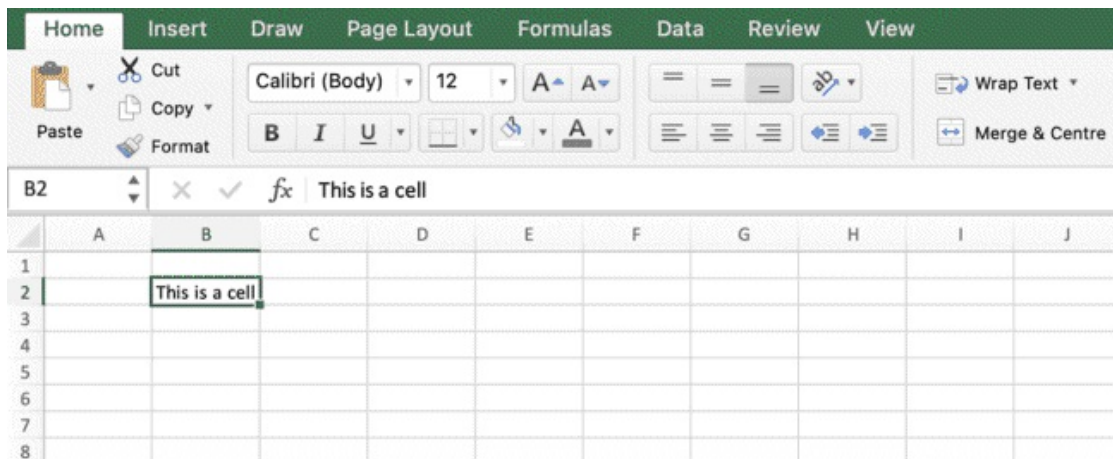
As you can see, the formula bar shows the selected cell content, whether is a number, a text string or formulas as we will see later in the book.

Also, below "Paste" in the top right corner of the ribbon, you can see the cell reference. B2, as the active cell is in column B and row 2, and this is reflected (these coordinates are called cell reference or cell address)

QUESTION: How do you expand the formula bar?

✂ **SHORTCUT:** CTRL + Shift + U (to expand and resize)

⏱ **MANUAL:** Hover over the lower border of the bar until your mouse icon becomes a resize icon.

Click and hold as you drag the bar border up or down to resize the bar.
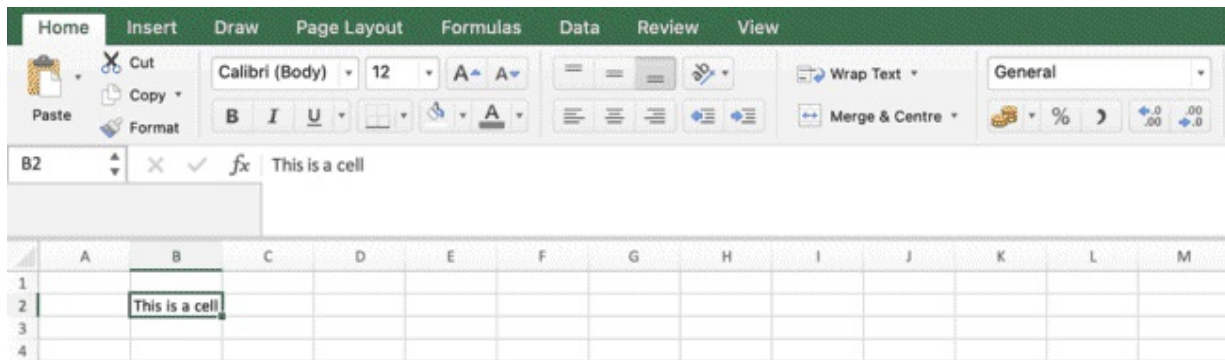
QUESTION: How do you edit a value in a cell?

✂ **SHORTCUT:** Click on the cell you want to edit and click F2 to step in and edit the value

⏱ **MANUAL:** Double click on the cell you want to edit to step in and edit the value.

⏱ **MANUAL:** Click on the cell you want to edit to select it and just type over a new value

⏱ **MANUAL:** Click on the cell you want to edit and change the value from the formula bar

⏱ **MANUAL:** Click on the cell and press BACKSPACE or DELETE to clear the content

These shortcuts are particularly useful when it comes to editing the content in a cell (whether it is a value, a text or a formula), rather than just typing over and delete the previously existing content.

The Ribbon

The Ribbon is the upper section of the interface between the branded green Excel bar and the worksheet with the cells.

The ribbon includes the commands and instructions to manipulate your data set.

We will not explore every section and sub-section of in the ribbon, but we will cover the most important things you need to do beginner, intermediate and advanced level tasks.

The ribbon is divided in section, you can access each section by clicking on it
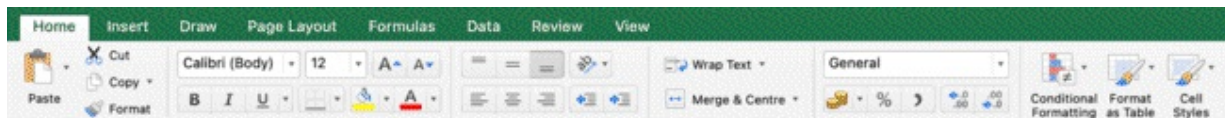
1. **Home** contains commands related to creating, formatting, and editing a spreadsheet.
2. **Insert** contains commands related to adding items to a spreadsheet such as graphics, tables, pivot tables, charts, headers and footers, hyperlinks etc…
3. **Page Layout** contains commands related to printing a spreadsheet.
4. **Formulas** contains commands related to formulas
5. **Data** contains commands related to importing and editing data
6. **Review** contains commands related to commenting, proof reading, tracking changes or protecting the spreadsheet.
7. **View** contains commands related to the layout the spreadsheet.

In addition to these 7 Tabs, there is an 8th one called the **Developer** tab that is hidden by default. The Developer tab contains commands related to recording macros and writing visual basic for application (VBA) code. This tab is hidden by default as most people will likely never want or need to use it.

VBA is the Excel coding language and allows you to create automations through simple code and it will not be covered in this book. I personally love it and used it a lot! But it's because I enjoy coding.

Once you create Pivot Tables, as we will see in the next chapters, the ribbon will also add new sections named **Pivot Table Analyse**, that will allow you to control and customise the table. The same will goes with Charts.

The ribbon includes a lot of different options and commands and it can also be customised to add quite a few options that are not visible by default. It will be very long to list all the options here, so we will go through some of the ribbon options to solve exercises and accomplish goals as we go through this book. So, by the end of it, you will have complete understanding of

the ribbon and you will be invited to explore it further should you need new options to work on your data in future.

Excel Fundamentals

Drag & Drop

Once you select a cell (or a range of cells), you will see the cursor icon change based on **where on the cell** you will place the cursor. You can place it outside the cell, on the side or on the bottom right corner, where you can notice a small square, which I will refer to as anchor point, because it actually allows you to anchor to the cell to drag and drop it.
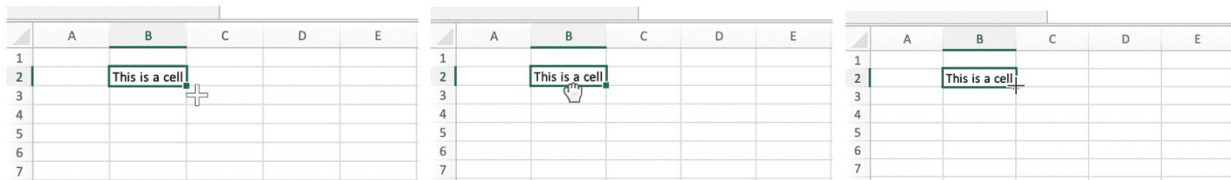
When you place the cursor on the side, the icon will become a hand (picture in the middle here above).

If you hold, you will be able to drag the cell around the worksheet and drop it where you want to release it.

Try to drag the cell in B2 and release it in B6.
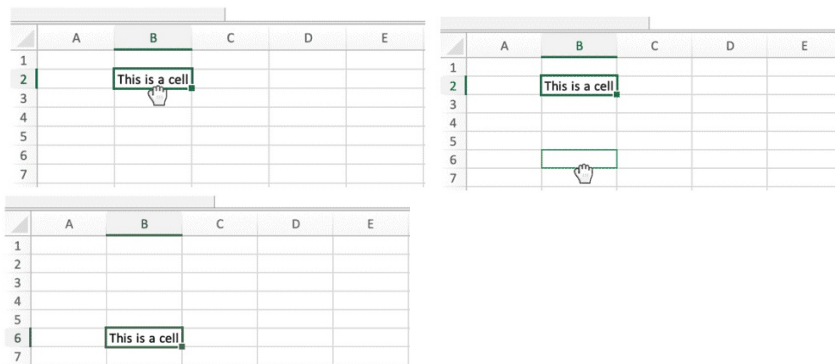
As we will see in the book, there is more than one way to do the same thing in Excel, and this is just one of the many.

The same principle applies to dragging and dropping ranges. Both tasks can also be accomplished through shortcuts, typing via the keyboard.

	A	B	C	D
1				
2				
3				
4				
5				
6		Data range	Data range	
7		Data range	Data range	
8				B7:C8
9				
10				
11				
12				
13				
14				

	A	B	C	D
1				
2				
3				
4				
5				
6		Data range	Data range	
7		Data range	Data range	
8				
9				B9:C10
10				
11				
12				
13				
14				

	A	B	C	D	E
1					
2					
3					
4					
5					
6					
7					
8					
9		Data range	Data range		
10		Data range	Data range		
11					
12					
13					
14					

Drag cells in Excel

One of the Excel fundamentals is dragging a cell to duplicate it or to autocomplete a pattern. Hover over the small square on the bottom right corner of the selected cells and you will see the cursor icon changing. **Click and hold.** Now you can drag the cell (or the range) to the left, to the right, to the top or the bottom, for as many cells as you need.
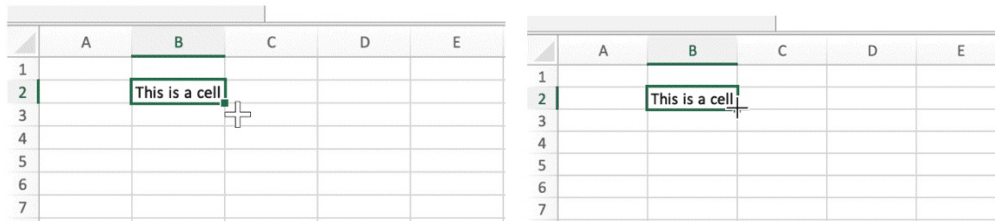
Let's see it through an example. On your opened file:

1. Select the cell in B4 (click on B4)
2. Type in the value 12 and press Enter
3. Hover over on the bottom right corner of the cell B4 on the little green squared anchor point
4. Click on the anchor point and hold, while dragging the cell down to B9
5. Release in D9
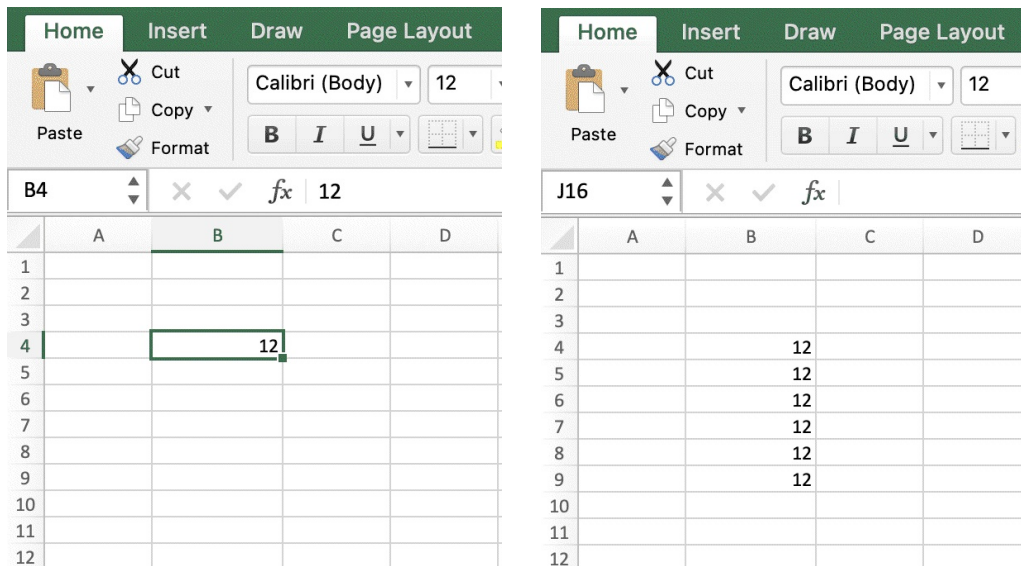
As you can see, dragging the cell down gave Excel the instruction to fill in the sequence. Excel filled in all the cells with the same value you started with. So, at this point, you should have 6 cells (from B4:B9) with the same value as B4.

6. Select B9, hold the bottom right corner of the cell as in point 3
7. Drag the cell to the right and release once you get to D9

You should now have the same value in 3 more cells (B9:D9) as a result of dragging the cell.
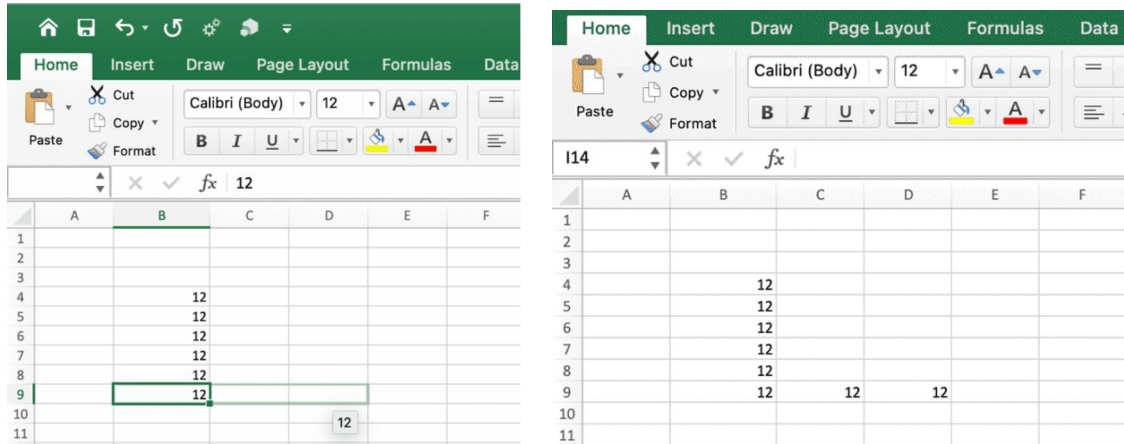
Dragging a cell (or a range) to fill the near cells is one of the most important things to master in Excel. You have just learnt how this works with one cell at a time in multiple directions. As we will go through the book, you will learn how to select cells in multiple ways, drag multiple ranges, fill cells following patterns, and much more.

For now, just remember: **hold the bottom right corner of a cell, drag and release.**

Now, let's clear the content and remove everything we wrote in the Worksheet.
Use your keyboard to execute the shortcuts.

Select every cell in the worksheet
✂ **SHORTCUT:** CTRL + A

Delete content
✂ **SHORTCUT** (Mac)**:** Backspace
✂ **SHORTCUT** (Windows) **:** CTRL + Shift + Delete

How to move through a dataset

You will use Excel, among others, for calculations, formulas, analytics and data set management. Mastering cells selection is going to be crucial to speed up your work and move through data sets fast.

QUESTION: How do you move through a dataset in Excel?
ANSWER: Using the keyboard arrows and combine them with keyboard buttons to leverage the shortcuts.

<u>HOW TO MOVE ONE CELL AT A TIME</u>
In your document, create a simple 3x4 table like the below.
1. Select the cell B1
2. Click on keyboard arrows to move within the table and outside the table

This is the most basic way to move through the Worksheet, one cell at a time.
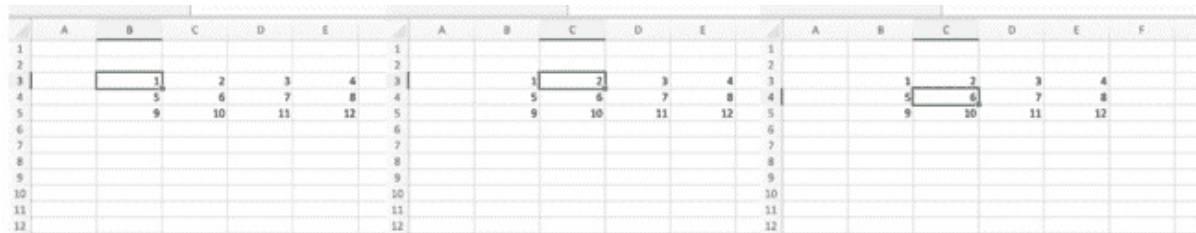
<u>HOW TO MOVE MULTIPLE CELLS AT A TIME</u>
3. Select the cell B3
4. Hold CTRL
5. Click on the Right Arrow (keyboard)

You should have now jumped to E3 in one click
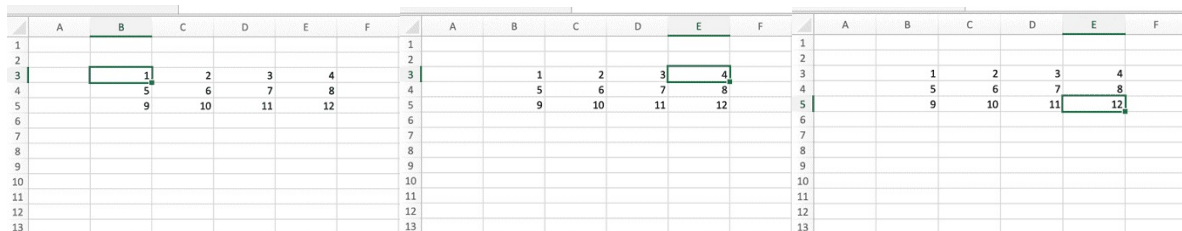
6. Now, while still holding CTRL, click on the Down Arrow

You should have now jumped to E5 in one click

7. Using CTRL + the Keyboard Arrows, you should now be able to move along the following to the 4 corners of the table

The combination CTRL + Keyboard Arrows will allow you to move from a cell to the last non-empty cell in that direction. Therefore, if you use the command to go in a direction where all the cells are empty, you will be redirected to the end of the Worksheet. If that happens, you can:

⏱ **MANUAL (FAST):** Hold CTRL + Keyboard Arrow in the opposite direction to what you have just done
✂ **SHORTCUT:** CTRL + Home
✂ **SHORTCUT:** Type A1 in the reference bar (top right corner)
✂ **SHORTCUT:** Click CTRL + G to open the Go To panel and type A1 under Reference. Press Enter.

Cell Selection

So far, we have learnt how to drag a cell, how to select a single cell, how to move through the cells one step at a time or multiple steps at a time.

We will now learn how to select multiple cells at a time.

1. Select the cell B4
2. Hold SHIFT
3. Click 3 times on the Down Arrow
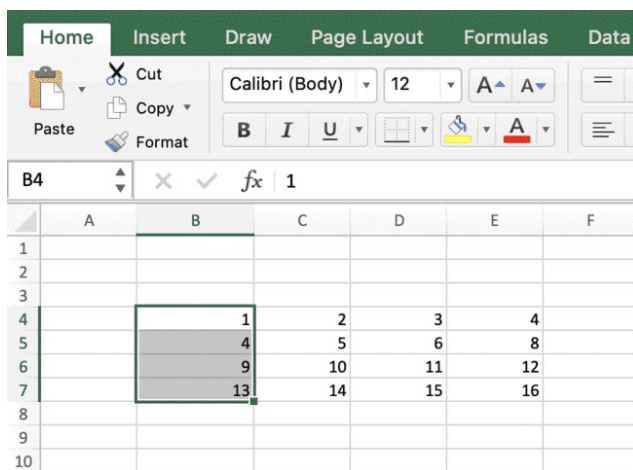
You should have now selected the entire first column of the table (B4:B7)

4. While still holding SHIFT, click and hold CTRL
5. Click on the Keyboard Right Arrow

You should have now selected the entire table.
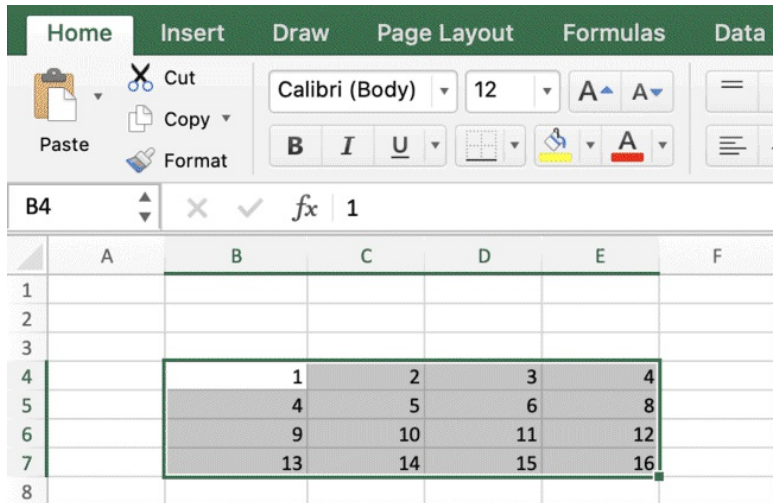
Now you can play around and select any cell of the table, hold SHIFT + CTRL and click on the keyboard arrows to get familiar with this selection process (selecting multiple cells at a time).

Last but not least, another way to select multiple cells at a time that you need to know is

1. Select the starting cell
2. Click and hold the right button
3. Move around with the mouse or the cursor to perform a manual selection
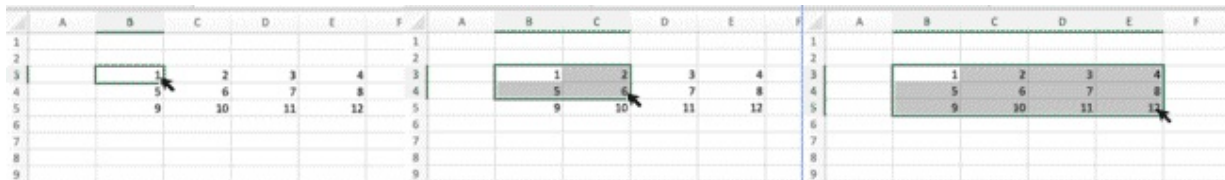
Drag a range

RANGE: a range is a group of one or more contiguous cells. As you may have already understood, we refer to ranges in Excel by referencing the first and the last cells of the range, starting from the top left.

Let's start from scratch. Select every cell in table however you want and delete content.

✄ **SHORTCUT** (Mac)**:** Backspace

✄ **SHORTCUT** (Windows)**:** CTRL + Shift + Delete

◊ Create a new table like the below

1. Now click on B4 and select B4:B7 however you want
2. Once all the cells are selected, hover over on B7 bottom right corner and hold the anchor point
3. Drag the selected column to the right, up to column E.
4. Release

You should have now duplicated B4:B7 into C, D and E, with identical values (second image). Dragging cells will instruct Excel to duplicate them exactly as they are or to fill in a sequence of values, when Excel recognizes a pattern.

Dragging a selected column, allowed to duplicate it to the right as it is.

We are about to explore the drag command further. You will understand how to leverage its potential to the fullest and learn how to manipulate your spreadsheet like a pro.

Moving through cells, selecting cells and dragging cells are among the Excel fundamentals and it is therefore essential for you to master these tasks.
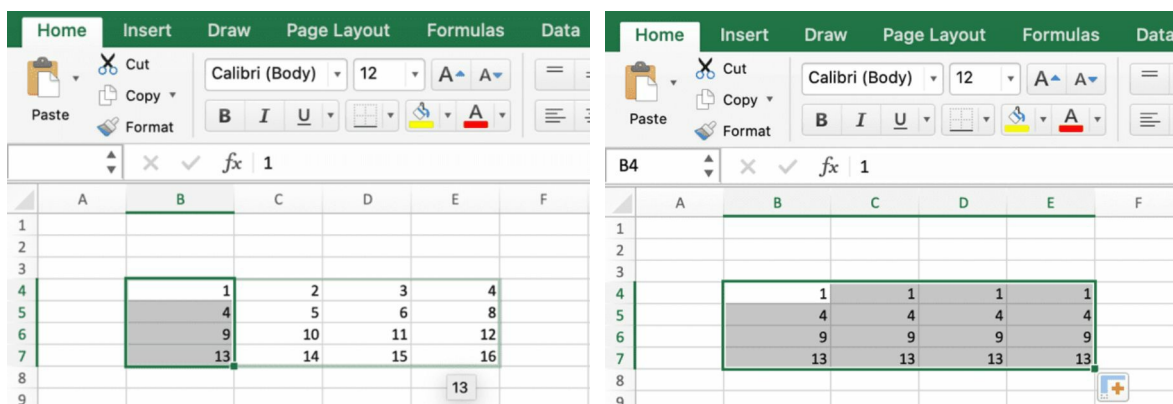
The formula Bar

When you select one cell, the formula bar in Excel shows one of the following

a. The same value displayed in the cell
b. The formula contained in the cell, if a formula was typed

Let's have a look at **the most basic formula in Excel**, which is when a cell is = to another cell. While it may seem very simple, we will learn how it can massively help you automate and even analyse entire datasets in a matter of clicks. This is one of the main things to remember: **master the fundamentals, understand the basics**, so when you will have to implement advanced strategy or try new things it will be much easier, as you will have acquired a new way of thinking.

You will be able to leverage simple concepts to solve complex problems.

1. Select the cell B8
2. Type =
3. Click on the cell B7
4. You will notice that both in B8 and in the formula bar it's displayed =B7
5. Press Enter to confirm
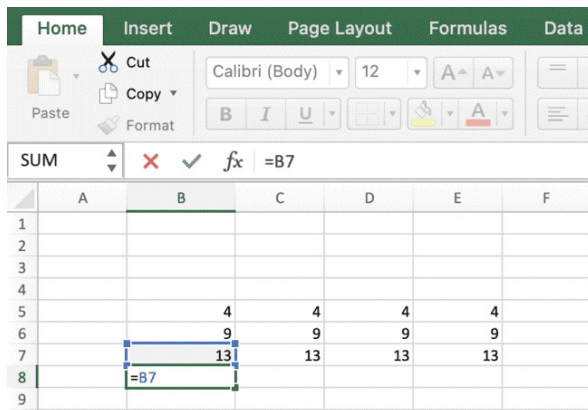
6. You can now click on B7 and type over Hello, to see the value in B8 changing to Hello as well
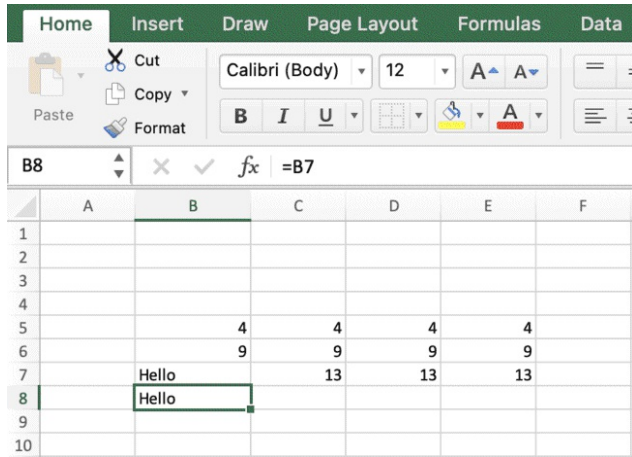
This is what happens when one cell is equal to another cell.

Dragging cells with formulas

When dragging a formula (in this instance the formula =B4 in cell B3), Excel will drag the cell and the cell reference values (the row and the column indexes in the formulas, here B and 4) following your instructions

1. Drag B8 to the right and release on E8
2. Select E8 and notice that the formula is now =E7
3. Select D8 and notice that the formula is now =D7
4. Select C8 and notice that the formula is now =C7

What happened here is that **Excel dragged the formula to the right and changed the column index** (B > E)**,** while the row index (7) hasn't changed. Each cell in Row 8 within the table is equal to the correspondent cell in Row 7 as a result of dragging the formula to the right.

5. Select E8 and drag it right one more cell and release in F8. F8 will be populated with a 0.
6. This is because F8 is now = F7. F7 is empty, so F8 = 0

You can see it from the cell, the formula bar, and also with a special shortcut to hide and show all the formulas in your spreadsheets.
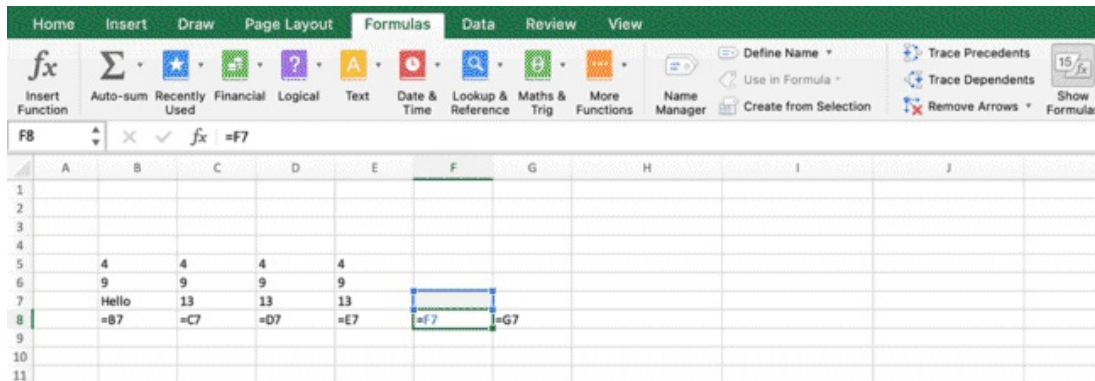
QUESTION: How do show/hide all the formulas in the worksheet in the spreadsheets (on/off)?

✂ **SHORTCUT** (Mac)**:** CTRL + ~

✂ **SHORTCUT** (Windows)**:** CTRL + '

⏱ **MANUAL:** Ribbon > Formulas > Show Formulas

Absolute Reference

QUESTION: How can we drag cells with formulas in Excel and avoid these problems?

ANSWER: In order to drag your formulas without incurring in this type of problems, you will have to use Absolute Reference.

Absolute Reference will allow you to lock the column index, the row index or both, so you will be able to create your formulas and drag them where you want with no errors. To add Absolute Reference, you simply have to add a $ before the row, the column or both in the formula

EXAMPLES

- B4 = reference to a cell in a formula
- $B4 = dollar sign before the column. The column index will be locked to column B
- B$4 = dollar sign before the row. The row index will be locked to row 4
- $B$4 = both cell row and column index are locked, so the formula will have the same value as B4 everywhere you drag it

✂ **SHORTCUT:** select the cell with the formula and then select the cell reference within the formula from the formula bar. Then press F4 to cycle through Absolute Reference (F4 once to lock columns, F4 twice to lock rows, F4 three times to lock both, F4 four times to unlock both)

⏱ **MANUAL:** Type the dollar sign everywhere you need in the formula
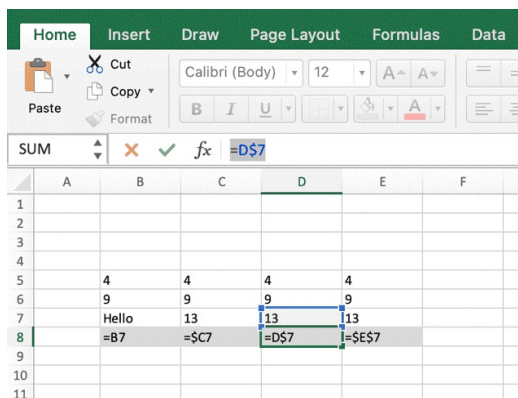
Let's see another example

This time I am creating a formula to calculate the discount I received with a specific offer during each month of the year. As you can see, the discount is in cell C2, so if I want to drag down my formula in D6, I have to lock the rows with absolute reference. There is no need to lock the columns as well, at this stage, because I am only going to drag my formula vertically.

As you can see, I can drag down my formula and C$2 won't change, while the reference in the Amount column will follow the pattern of the formula as I drag it down.

You can lock the column when you need to drag the same cell horizontally, or lock rows and columns if you need, for instance, to drag cells from a specific table across formulas in the spreadsheet.

Let's do a quick recap, what you have learnt so far.
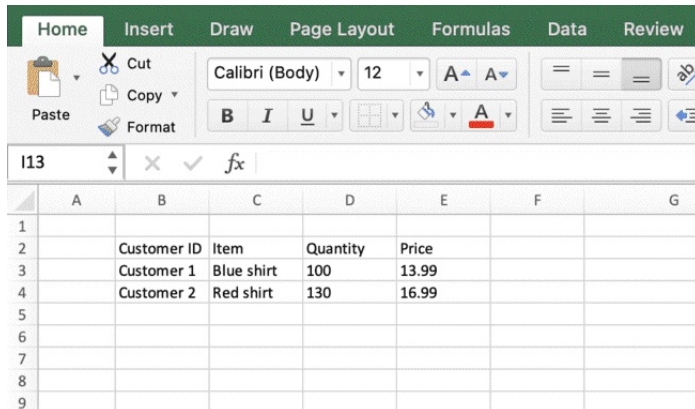As for now, you should be able to
- Type within cells
  - Type over
  - Double click to edit text within a cell
  - Select cell and type in the formula bar
- Move through the data set
  - Manually with cursor

- Keyboard arrows & shortcuts to move faster
- Select cells
  - Manually with cursor
  - Keyboard arrows & shortcuts
  - Select single cells, ranges and tables
- Drag cells
  - With one or more cells selected, drag the anchor point in any of the 4 directions to duplicate cells or follow patterns (as we will see in the next section)
- Understand formula basics
  - Type =(Column, Row) to link two cells
- Drag cells with formulas and use Absolute Reference
  - You can drag and duplicate cells with formulas
  - Rows and columns references will vary accordingly
  - You can lock them using Absolute Reference

Drag cells and fill-in a pattern or a sequence

Now let's work on another example to apply what we learnt and level up our skills.
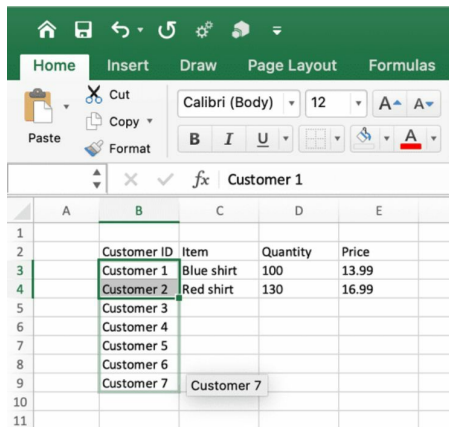
1. Let's create a table with the following headers: Customer ID, Item, Quantity, Price, Revenue

2. Write the values in the cells as below

Now we will drag multiple cells

3. Select cells B3 and B4
4. Click on B4 lower anchor point
5. Drag down until B9

As you can see, **Excel recognized a pattern** between Customer 1 and Customer 2 (selected) and guessed how you wanted to autofill the cells below when dragging those 2 down. When you select multiple cells and drag them simultaneously, Excel will look for a pattern and will fill-in the sequence accordingly.

6. Select cells C3 and C4

7. Click on C4 lower anchor point

8. Drag down until C9
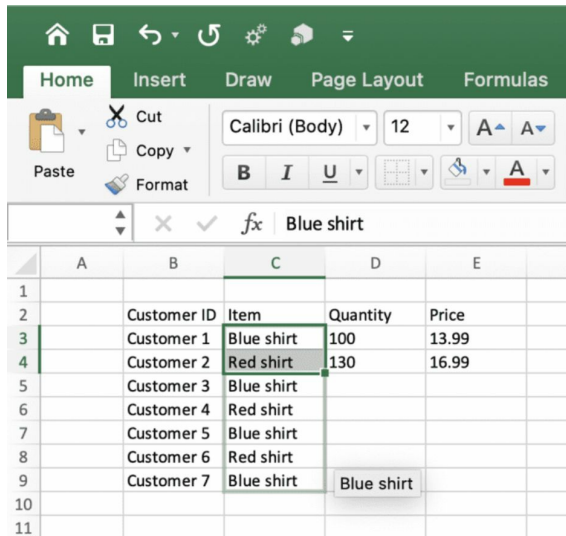
The pattern recognized by Excel is in this case is the alternance of two string values (Blue shirt and Red shirt), that will be replicated according to the starting sequence selected

9. Repeat the same step for Quantity
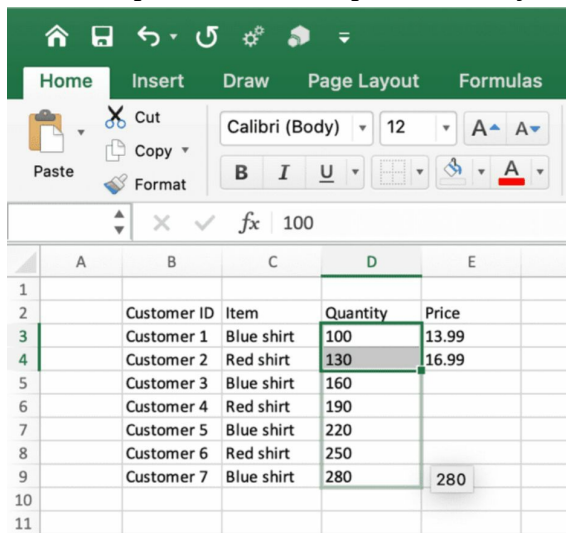
Excel has now recognized the pattern "step 30" and will replicate it automatically (there is a step 30 between 100 and 130, so Excel will fill it down with 130+30, 160+30, and so on.

✏ **NOTE:** You could have also done the last 3 steps in one action, by selecting the range

A3:D4 and drag and drop the range down (one single selection and dragging down the range, as shown in the next image)
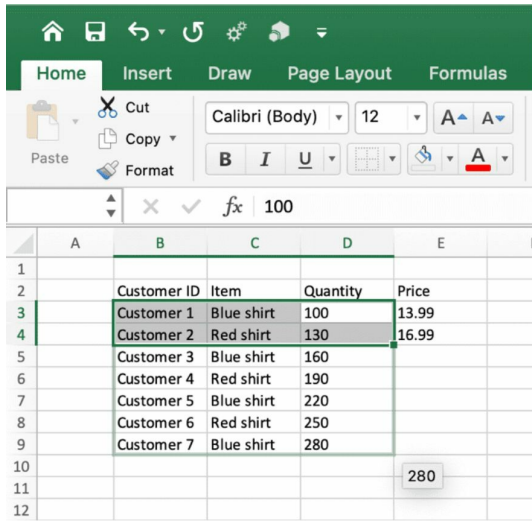
10.   When you get to the column Price, just manually type in the 2 prices throughout the sequence

The reason is that we only have 2 prices for 2 items, and if you try to drag and drop E3+E4, Excel will fill in with prices with step 3. You are welcome to try it yourself, and then undo with CTRL + Z.

11.   Add a header in F2 and write Revenue
12.   Click on F3 and type =E3*D3 and press Enter
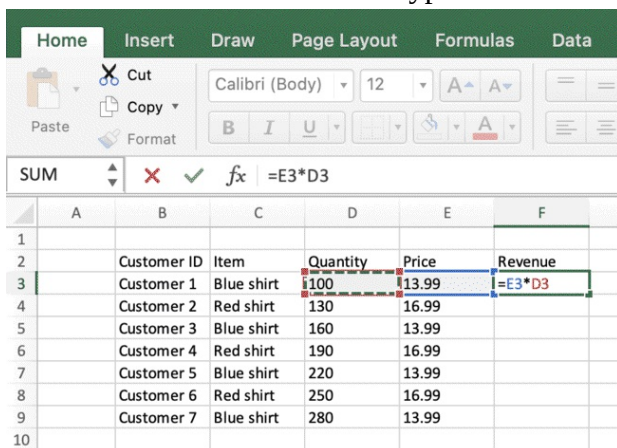
You have now calculated a formula with 2 cells.

You can do it as well by

- clicking on F3, step in the cell with double click and insert =
- then click on E3
- then type *
- then click on D3 and press Enter

13.   It's time to drag it down to calculate the revenue that every customer brought in, and you can do it in 2 ways:
   a. Drag down the cell while holding on the anchor point
   b. Double click on the anchor point

✂ **SHORTCUT:** double click on a cell anchor point or range anchor point to fill the sequence down

A double click on the anchor point is a shortcut for drag & release. It works in tables and will fill the sequence down until the last non empty cell.
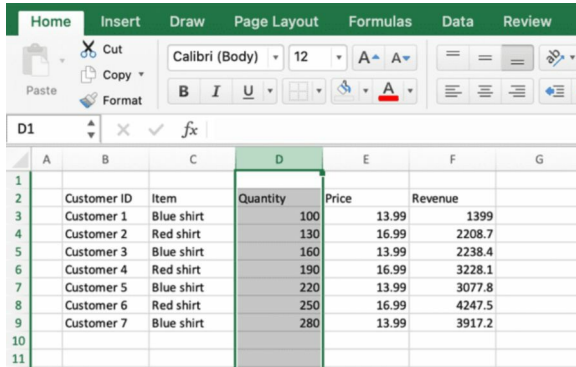
Once you select a cell or a range, double clicking on the anchor point will auto-fill the sequence down, up to the last non empty cells on the nearest column.
This last formula will complete the sequence down until an empty cell is found in the column on the left.

Column Selection
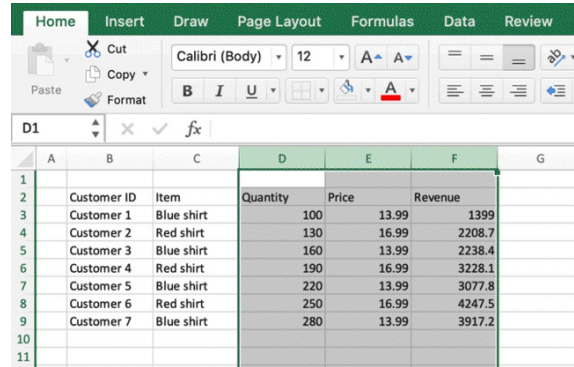
In order to select all the columns in a table and beyond (select the entire column) do the following

1. Click on the D header of column D
2. Hold and drag the selection up to F, the last column

Change column width

Now let's autofit the columns. Autofit is a command that allows you to adjust the column width in order to fully display all the values within the cells in the column. It's particularly useful when you have long values in the cells and you can do it in two ways

COLUMN AUTOFIT: Double click **in between 2 row headers in the selection** (e.g., between C and D, or D and E or any other in-between space between two columns). This will fit all the columns size.


MANUAL COLUMN FIT: If you notice that the column size has become too small or too big, you can adjust it by resizing one specific column or all the columns to the same size.
Select again all the columns. Select Column C, hold and drag the selection up to column F.

Now click on the same space in between two columns, **but instead of double clicking, just hold and slowly drag to the right.** You will see a label showing the width changes.

Once you release, all the columns selected will have the same size.

You can also do this with one column at a time, to give the table the exact look you want.
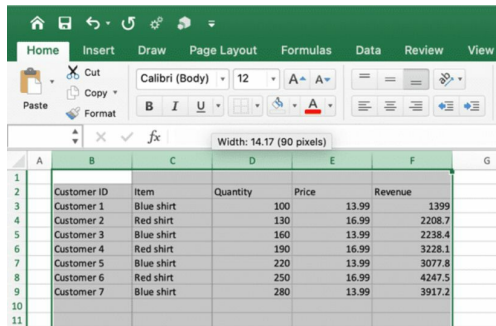
It may happen to receive a data set that we may define "messy", using a colloquial expression, so you may have to spend some time in just by improving the visualisation before starting to work.

You can see an example. Notice how column F is so small, that the values are not displayed, instead we see a set of #### and we need to increase the column size.

Select all

✂ **SHORTCUT:** CTRL + A

⏱ **MANUAL:** Select rows and columns manually

COLUMNS AUTOFIT: Double click on any space in between two columns to fit the columns

ROWS AUTOFIT: Double click on any space in between two rows to fit the rows

Now let's continue the exercise by adding new shortcuts, tips and tricks that will level up your skills, as we keep progressing with the task complexity.

Formatting Shortcuts & tricks

Select every cell in the worksheet

✂ **SHORTCUT:** CTRL + A

⏱ **MANUAL:** Click on the top right button between Row 1 and Column A

Change background color

Once the cells are selected, click on the color background icon and select white (Ribbon > Home)

The grey border lines should have disappeared.

To make them re-appear, just repeat this process but select "No Fill" instead of white
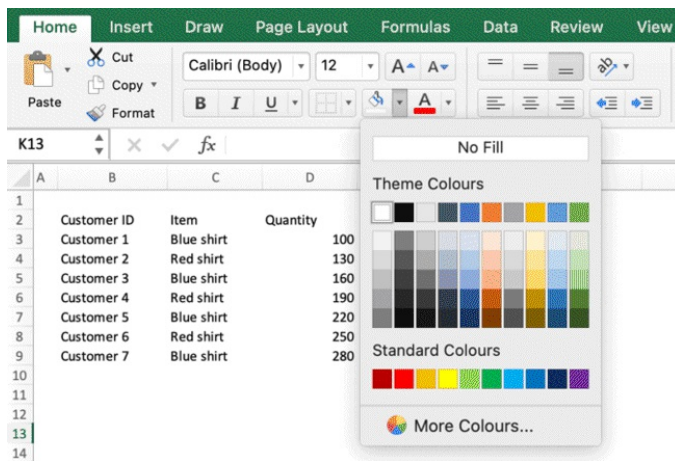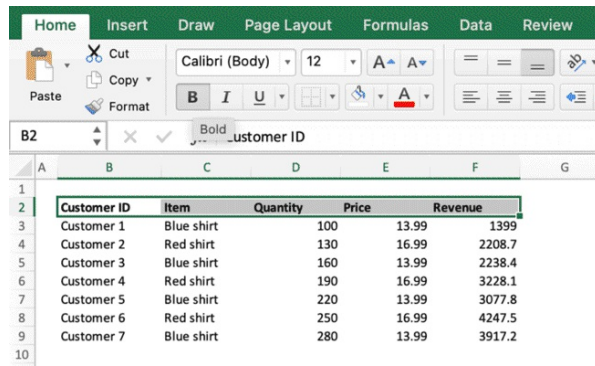
Apply bold formatting to the headers

Select the headers in the table

✂ **SHORTCUT:** CTRL + B

⏱ **MANUAL:** Click on the **B** icon on the upper left part of the screen

Add outside borders to the table

Select the full table

✂ **SHORTCUT:** CTRL + Shift + &

Add all borders to the table

Select the full table

✂ **SHORTCUT:** Press CTRL + Shift + - to remove outside border (optional)

⏱ **MANUAL:** Click on the Border Icon in the ribbon and get full access to all borders, you can change colors, border type, thickness and more
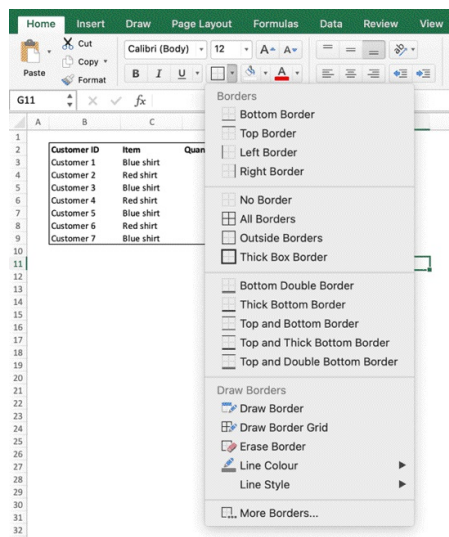
Text Align

Select the entire table (or select the columns by selecting them from the headers as shown above) and click on the Centre Text button or any other option from the Ribbon (Centre left, Centre right).
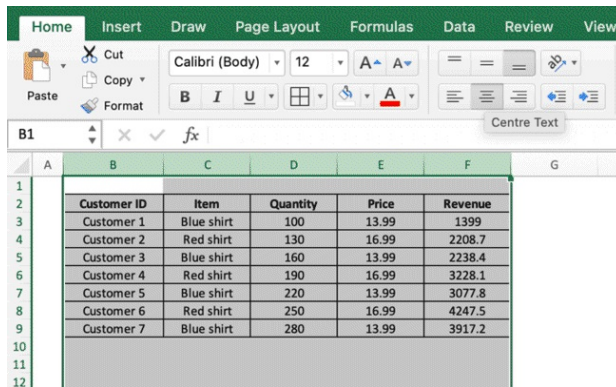
As you can see the table starts to look cleaner and better designed. But all the numbers look the same and lack formatting, so we still need to work on it.

Number Formatting

Select all the Price and Revenue cells or simply select columns E and F, then you can

1. Click on the little down arrow near the coin sign and select your currency
2. Click on the little down arrow near the coin sign and select "more accounting formats" if your currency is not there
3. ✂ **SHORTCUT:** select the cells and click CTRL + 1 to open the currency formatting panel
4. Use other shortcuts we will show later to automatically format the currency in dollars
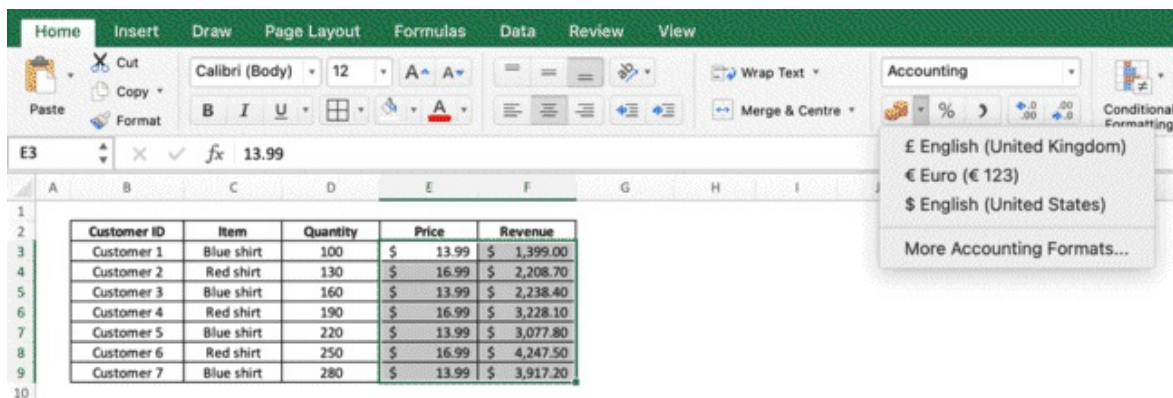
Adjusting decimal points

You can adjust the number of decimals points both in the formatting panel and within the main interface. You can increase and decrease decimals by clicking on the buttons near the currency icons in the ribbon.
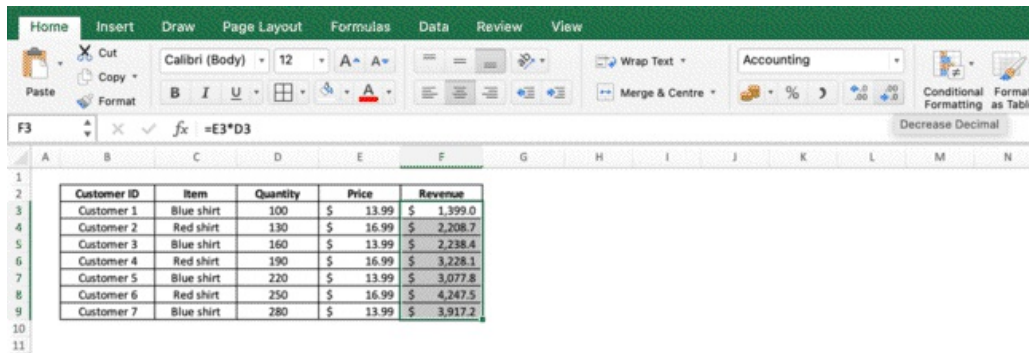
Copy, Paste, Cut

You are about to learn simple commands that work across the entire Microsoft Office Suite

✂ **SHORTCUT:** Select the entire table and press CTRL + X to copy and cut it

Select cell H3

✂ **SHORTCUT:** Click CTRL + V to paste table (we moved the table from B2 to H2)
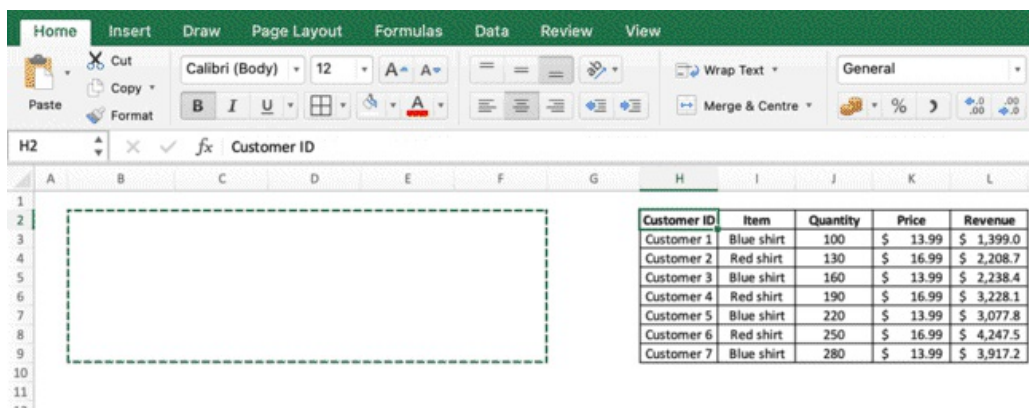
This command will allow you to move cells from a point to the other (cut and paste).

You can obtain the same result by selecting the full table, holding the border of the selection (until you see the hand icon) and simply drag and drop the entire table to another place in in the worksheet.

✂ **SHORTCUT:** You can instead copy-paste values by using the shortcuts CTRL + C, CTRL + V

This will duplicate your table, leaving the original table in B2 and creating a copy wherever you paste it.

Undo Action / Redo Action

✂ **SHORTCUT:** CTRL + Z to undo action

✂ **SHORTCUT:** CTRL + Y to redo action

You can also do the same tasks by clicking on the arrows on the upper-left side of the screen
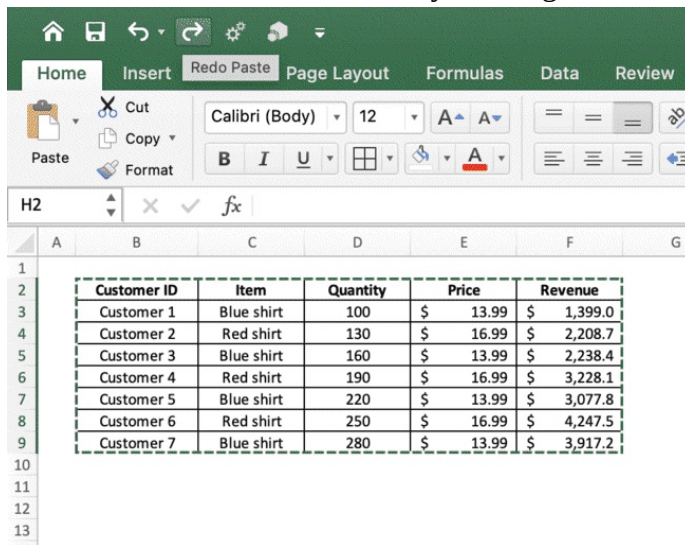
Add and remove filters

You can add filters to tables. Filters will allow you to sort the table values in different ways or show only specific values that match selected conditions.

Select the entire table

✂ **SHORTCUT:** Click CTRL + SHIFT + L to add filters

⏱ **MANUAL:** You can click CTRL + SHIFT + L to toggle the filters off, and you can manually do it by clicking on the funnel icon on the upper right corner with the text "sort and filter" in the Home Tab.
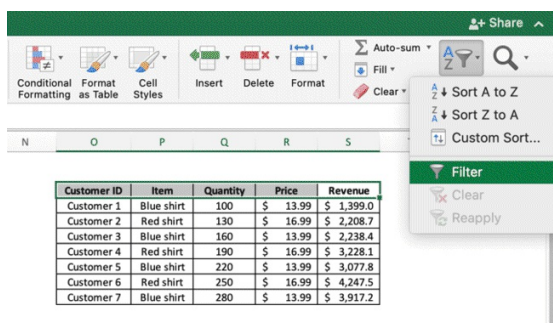
Once you have applied the filters, click on the filter icon in the Revenue header cell.

You can now edit the entire table by applying conditions to the Revenue Column.

You can sort the column in ascending or descending order

you can hide / show specific values by unticking / ticking them

you can also create numerical conditions by clicking on "choose one" from the sort panel
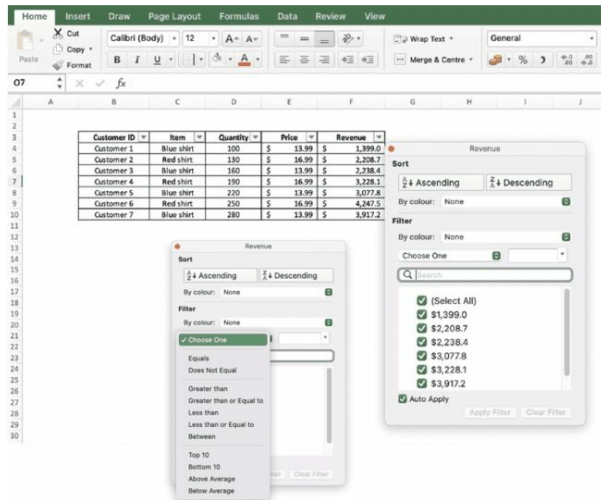
You can remove all the conditions applied in 3 ways

✄ **SHORTCUT:** Select the table and click CTRL + SHIFT + L to remove the filters and any condition

⏱ **MANUAL:** Select the table and click on the funnel icon to remove filters and conditions

✄ **SHORTCUT:** Click CTRL + Z to undo action(s)

Filters is one of the most important features in Excel. Mastering filters will allow you to quickly analyse and process your data, managing large datasets and find the insights you need in a blink of an eye.

Excel Formulas

Sum, Count, Average

You have previously learnt how to create a formula by multiplying two cells (price and units to calculate Revenue, or discounts) and using Absolute Reference when dragging cells containing a formula. It goes without saying, that as you can multiply two values within two cells, you can create mathematical formulas as well. Excel has also a vast set of pre-made functions you can use to your advantage to speed up your work. We are now going to learn:

- Sum() = returns the sum value of the cells selected in a range
- Count() = returns the number of items in a selected range
- Average() = returns the average value of the cells selected in a range

Let's continue working on the table we created earlier and let's add three formulas

- In H4 write Total Quantity
- In cell I4 type Total Revenue
- In H5 write =sum(E4:E10)
- In I5 type =sum(F4:F10)
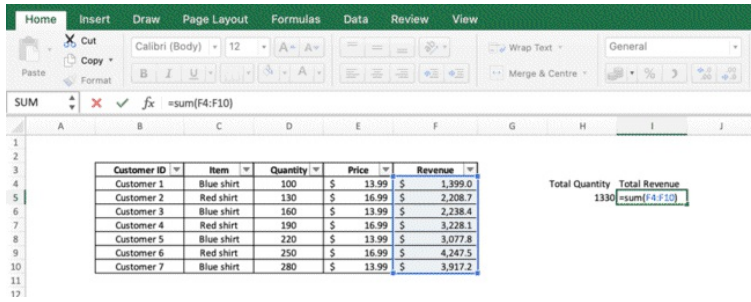
You can also manually select the range of cells once you have opened the brackets in the formula and then close it and press enter

- In J4 type Average Revenue
- In J5 type =Average(F4:F10) (or select the range with the cursor once the bracket is open)
- Now, the table should be as follows
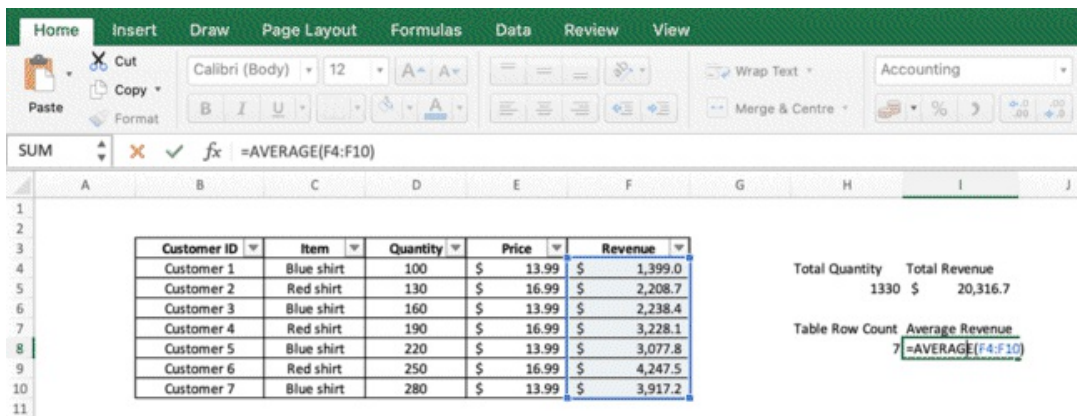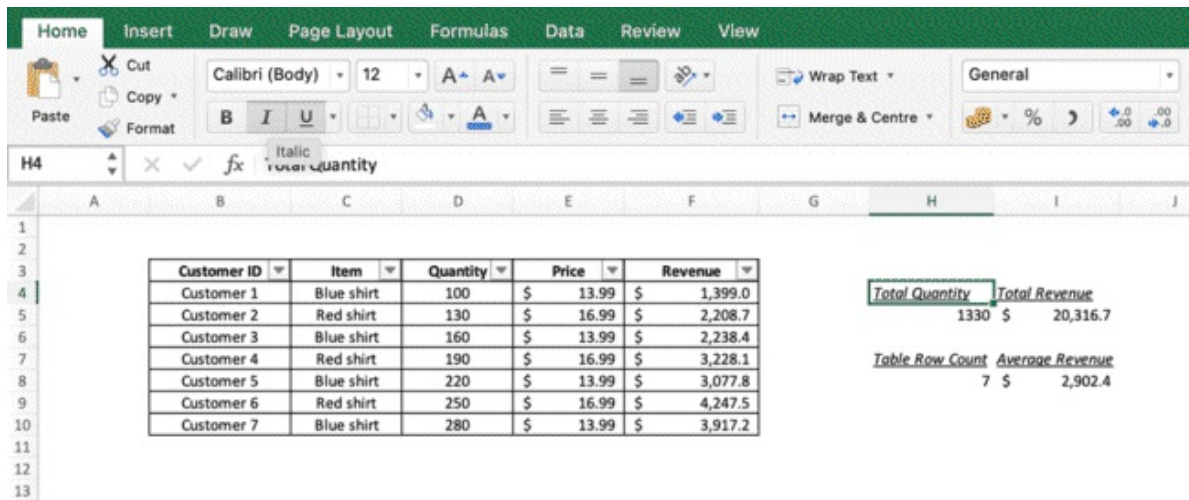
Formatting text – Underline and Italic

Select the 4 cells with the headers you have just created

✂ **SHORTCUT (**<u>Underline</u>**):** Press CTRL + S (Press again to remove)

✂ **SHORTCUT** *(Italic)*: Press CTRL + I (Press again to remove)

You can obtain the same output by selecting the cells and pressing on the icons I and <u>U</u> in the Ribbon above the formula bar.

Editing the worksheet

Insert column(s)

Select column B by clicking on the B Header

✂ **SHORTCUT:** Press CTRL + SHIFT + +

⏱ **MANUAL:** Right click on column B header > Insert

If you select multiple columns, step 2 will add the same number of columns selected

For instance, if you select 3 columns and insert, you will insert 3 new columns.
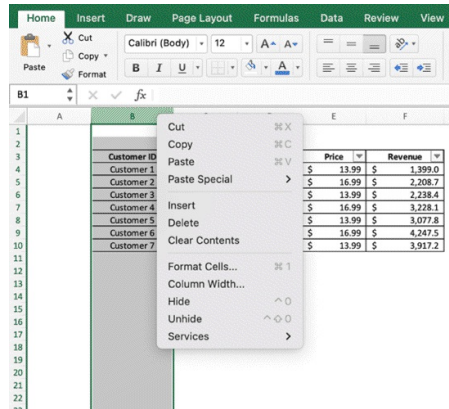
Delete Column(s)

Select column B by clicking on the B header

✂ **SHORTCUT:** Press CTRL + SHIFT + -

⏱ **MANUAL:** Right click on column B header > Delete

If you select multiple columns, step 2 will delete them

Hide Column(s)

Select column D by clicking on the D header

✂ **SHORTCUT:** Press CTRL + 0

⏱ **MANUAL:** Right click > Hide

If you select multiple columns, step 2 will hide them

Unhide Column(s)

Select column D by clicking on the D header

✂ **SHORTCUT:** Press CTRL + SHIFT +)

⏱ **MANUAL:** Right click > Unhide

If you select multiple columns, step 2 will unhide them

The same principles apply to Rows

Add Row(s) - ✂ **SHORTCUT:** CTRL + SHIFT + +

Delete Row(s) - ✂ **SHORTCUT:** CTRL + -

Hide Row(s) - ✂ **SHORTCUT:** CTRL + 9

Unhide Row(s) - ✂ **SHORTCUT:** CTRL + SHIFT + (

In this example, we selected 2 columns (B and C) > right click > insert. We now have two new empty columns and the rest of the columns in between have been moved to the right.

So far, we have seen how to add / remove / hide / unhide entire rows and columns. What if you wanted to edit the table only, without changing the rest of the Worksheet? <u>Simply select the data range you want</u>, right click, insert, delete or chose among other options as needed.
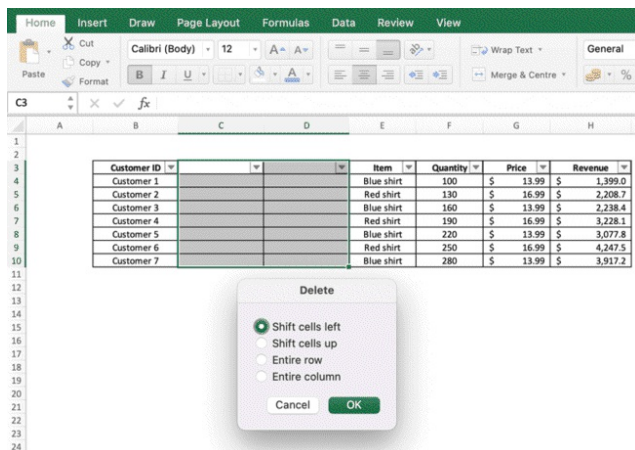
You can remove the selected cells by clicking on the most appropriate option (in this instance, shift cells to left will revert the table to our original configuration). The main difference between removing columns and removing cells, is that sometimes you only want to edit a specific range

of cells and let the rest of the column unchanged. In this case, you will only remove a range of cells you select, leaving the cells above and below untouched.

Let's continue with the following
- Click CTRL + A to select the entire sheet
- Change the background color to No Fill
- click CTRL + SHIFT + L to remove filters
- Select the entire table
- CTRL + X to cut
- CTRL + V to paste it in Cell A1 (we cut-pasted the table in A1)

Now let's add a few more values to the table. As you can see, we have 7 clients, that purchased 2 different types of items in different quantities.

�� We want to double that, but keeping clients and items to 7 and 2.

- Copy all the table values (don't copy the headers) and paste them in the first empty cell below (A9)

We have now duplicated the cells and doubled values for each client.
If we received this data set (or a larger one), we wouldn't be able to tell, at a glance, how many items of the first type each customer has ordered, or the revenue associated to each item across all 7 customers.
In order to analyse this data better and faster, we will have to use one of the most important concepts of Excel: Pivot Tables

In this section, you learnt how to use shortcuts and commands to clean your spreadsheet, improve formatting, maximise clarity and visibility, add formulas, toggle filters and other ways to manipulate the spreadsheets before starting to work on your data. Keep practicing, get familiar with selection, drag & release, copy-paste, undo-redo, inserting, deleting, hiding and fitting columns, and soon you will be able to do exactly what you need to do, when you need to do it. In the next section, we will learn about another fundamental topic in Excel, which will allow you to massively speed up your work, especially when managing large data sets.

Get ready to become a master at using Pivot Tables.

Chapter 5: Pivot Tables

Pivot Tables

Pivot Tables are an absolute must know when it comes to Excel. They allow you to transform a dataset into a table, analyse data, use filters, create charts, interactive dashboards and much more. Pivot Tables are a powerful tool that can automatically count, sort, calculate and summarise data for you. They have pros and cons, they can be very useful, but they are not intuitive and, if you don't master them, they can slow your work down and you will waste time.

We are now going to look at Pivot Table to understand the basics, how they function, and see multiple strategies to help you use them at your advantage and save hours of work every time.

Transform your dataset into a table

Every Pivot Table is linked to a data source. Every time your data source change (in this instance, our table with 7 customer records), you will have to manually **REFRESH** the pivot tables linked to it or **CHANGE DATASOURCE,** in the event your new data has more records or you simply want to place the data source in another sheet.

Imagining that next week we will have new data, we want to optimise all the work that we are going to do now with the Pivot Tables, as doing it every week from scratch will be too time-consuming (I will show you how to create pivot tables fast and handy strategies to go even faster, but the reality is that these procedures are not very fast, so you want to get the most out of the Excel automation capabilities and plan ahead, knowing you are building Pivot Table <u>to automate a process over the weeks</u>)

Transform your data set into a table

Select the entire table

✄ **SHORTCUT:** Click CTRL + T

Your selected data is highlighted in the data range box. Don't edit it. Just make sure all the data in your table is selected properly. Press Enter to confirm
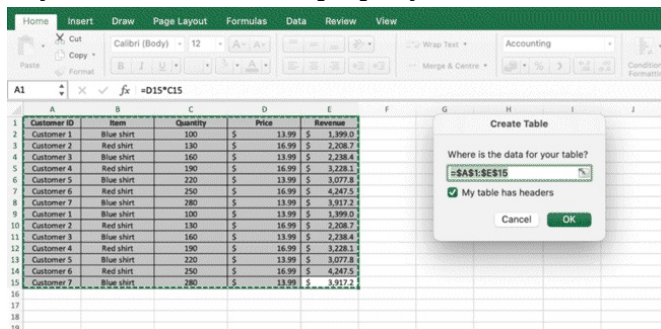
You can get the same outcome by selecting the table and press from the Ribbon

Home > Format as a Table
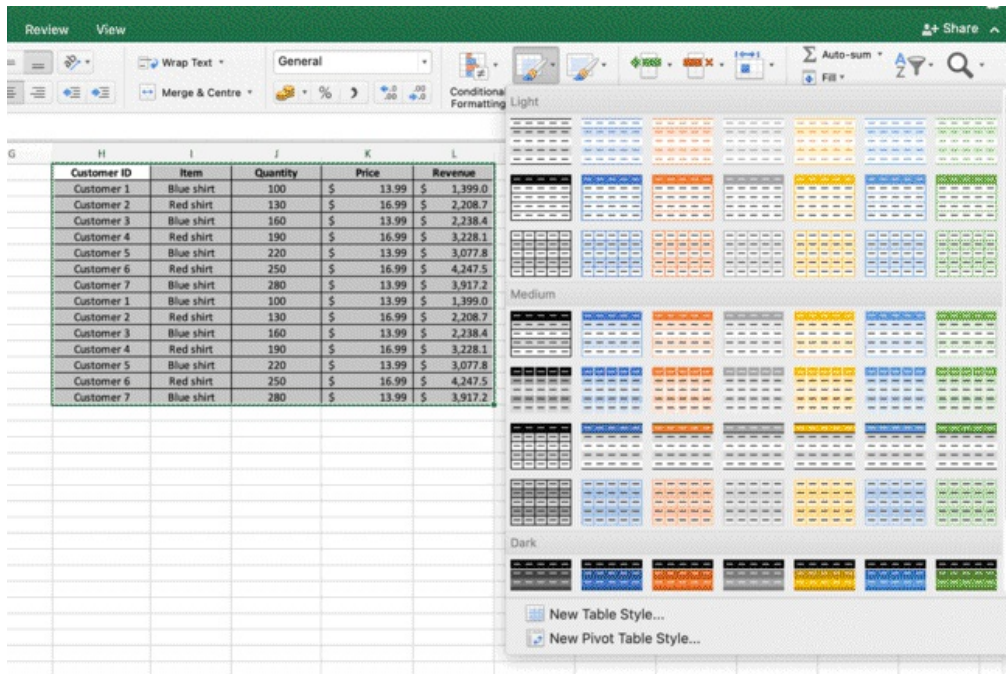
One you format your data set as a table, you will see that the look of your data set changes. You can click anywhere in the table at any time and you will notice that a new section named Table has been added to the Ribbon. From this section, you are able to change the table settings, select or create a style, change rows and columns and much more.
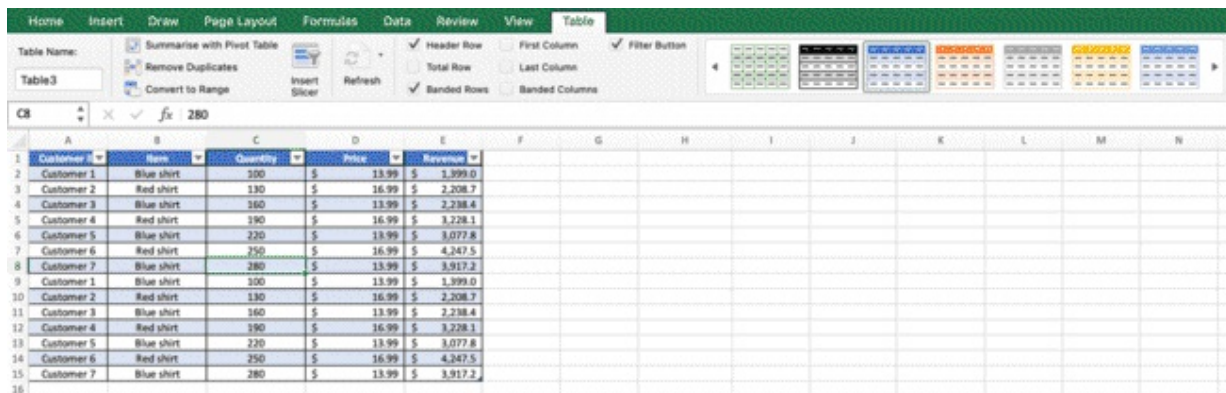
QUESTION: Why do you need format my data as a table before creating a Pivot Table?

ANSWER: To automate the process. In fact, you are now going to select your table to create a Pivot Table. Which is different than creating a Pivot Table from a simple data range.

The problem is that all the pivots you are going to create will get the data from the range A1:E15, which is the current range of your table.

But what if tomorrow the range is A1:E16, with a new row added to the bottom?

The Pivot Tables you have created today will not automatically update, and you will have to manually update them all with the new data source to see the updates in the Pivots.

But if you transform your data into a table BEFORE creating a Pivot Table, you will never have this problem, and the Pivot Table will get the range updates automatically as your data changes.

Multiply this for all the data sets you will analyse, all the pivot tables you will create, and all the times you will have to update every table. It's an incredible amount of time, and a lot of manual work.

This simple process, will save you all that time!

Now, you can even add a new row manually on the bottom and you will notice that it will become part of the table automatically.

Create a Pivot Table

1. Click anywhere in the Table
2. From the ribbon, click on Insert > Pivot Table
3. Press OK to confirm the creation of a Pivot Table in a new Worksheet (here named Sheet 2, it follows the number of the previous sheet)
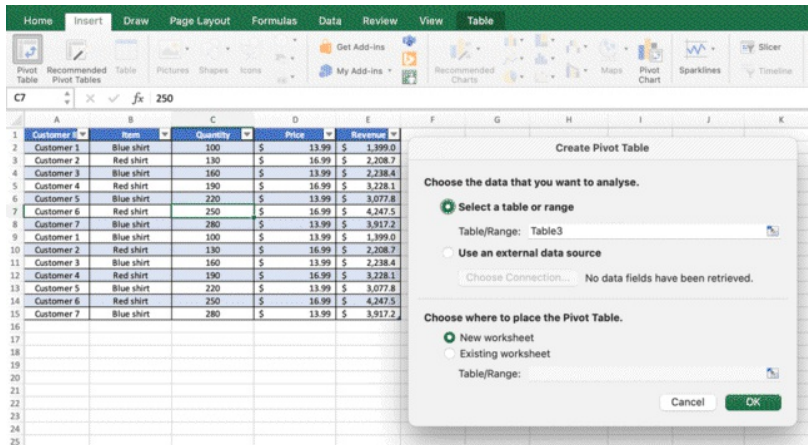
You can also add the pivot table to the current worksheet or CTRL + X, CTRL + V everything later, therefore I suggest to always create the Pivot Table in a new sheet.
As you can see a new sheet has been created
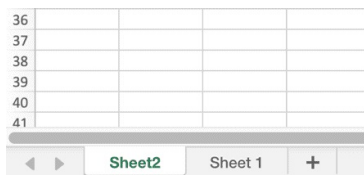
The new sheet has also 2 new sections in the Ribbon that will appear when you click on the Pivot Table. These sections are named Pivot Table Analyse and Design. You can already see the two buttons **REFRESH** and **CHANGE DATA SOURCE** we mentioned earlier.
You will need to refresh your data from the pivot if you update Sheet 1, but not to change the datasource, if you will keep updating it in Sheet 1 over the weeks.
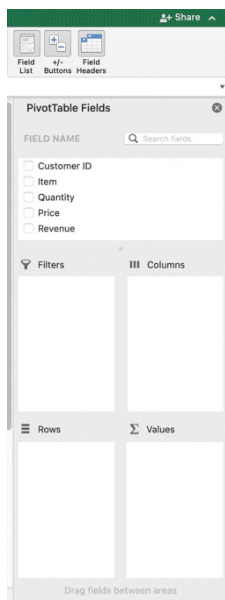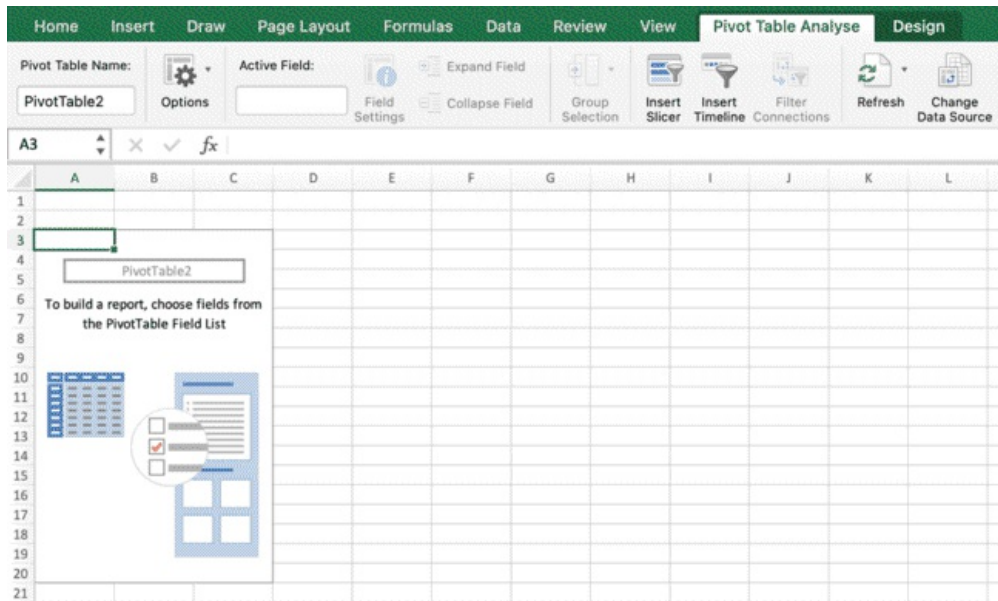
You may also notice the field list in the right side of the screen and 4 boxes (Filters, Columns, Rows, Values) that you will use to change your Pivot Table by dragging and dropping the fields.

✎ **NOTE:** if you create two distinct pivot tables, you can click on each of them individually to access the linked field list and edit the table, one at a time.

✎ **NOTE:** This is the field list. It will appear when you click on the pivot table, it will disappear once you click out. If, for some reasons, you cannot see it anymore despite you are selecting the Pivot Table

1. Click anywhere in the pivot table
2. From the Ribbon, Select Pivot Table Analyse

3. Click on Field List

Et voila'! The Field List should have now re-appeared.
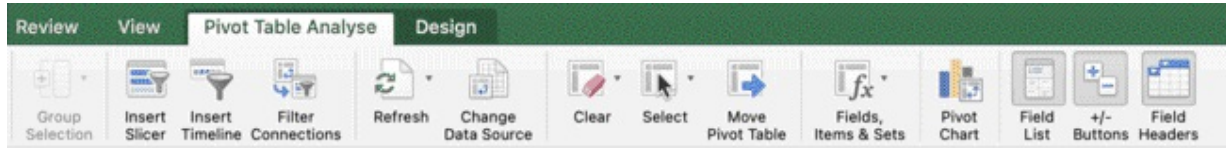
Now, let's start creating the table by dragging and dropping fields in the boxes.

1. Drag & drop Client ID in Row
2. Drag & drop Quantity in Values
3. Drag & drop Price in Values
4. Drag & drop Revenue in Values

This starts to look like the table we have created at the beginning, but now the data is aggregated.
Remember when we duplicated the table and pasted the values on the bottom?
This pivot table has all the customer values, but added up and summarised.

As soon as you drag & drop your fields, you will notice the following
- the numbers are not formatted
- the fields appear with a Sum of before the name.
- looking at the values in the Values Box, we can see that they are all marked as "Sum"
- Something off in the Price column. The prices are higher than they should be, and so the sum of all the prices in the total column.

Let's start by formatting the values in Quantity. We want them to be in scientific format.
Contrarily to what we have previously done with formatting, with shortcuts or commands from

the ribbon, we can't format Pivot Tables the fast way.

This is because if we do so, when we update the data and **REFRESH PIVOT TABLE**, we will lose all the formatting and we will have to do it from scratch!

So, one of the ways to avoid it is simply clicking on the *i* icon near the data field and select the format from there.

Other quick ways to do it are

1. right click on the data > Number Format
2. right click on the data > Value Field Settings
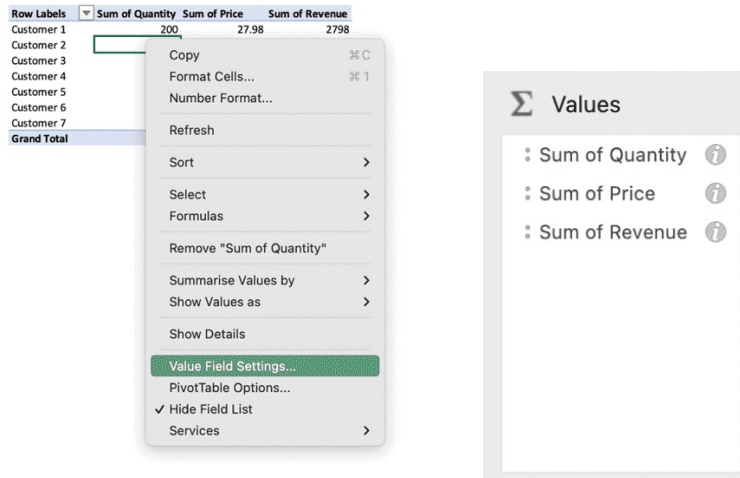
3. Click on the data > Ribbon Pivot Table Analyse > Field Settings
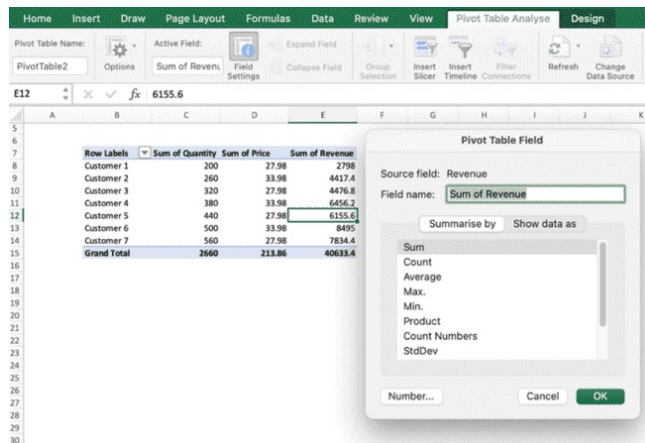
You can select "number", add 1,000 comma separator and select 0 decimals.
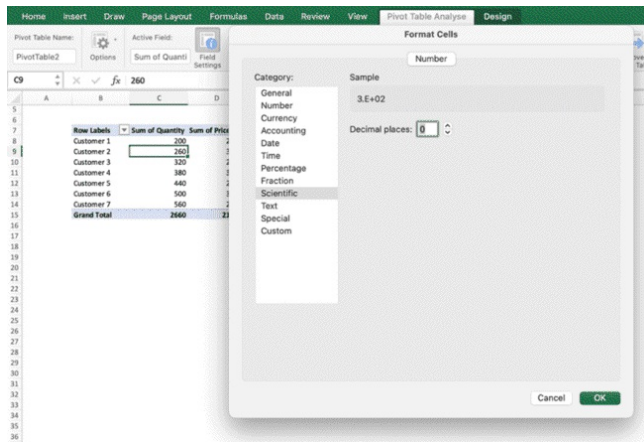
As regards Count, it will display the count of the items (in this instance =7, which is the number of rows in the Pivot Table). Generally, Sum is the most used, that's why it is in most cases the default option.

This doesn't always work. As mentioned, we can see that Pricing is off. **This is because the pivot is calculating this metric as a sum of values**, but the prices don't double with the number of items sold or the number of customers. We don't need a sum operator for this field and we need to amend it manually.

So, we will select Average. The Pivot will calculate the Average Price, and as the each item has its own price, they will now be displayed correctly.

Now, format Revenue and select $ (US dollar) from the currency dropdown list.

Click on the data > Ribbon Pivot Table Analyse > Field Settings

The Pivot Table is now formatted.

Row Labels	Sum of Quantity	Average of Price	Sum of Revenue
Customer 1	200	$13.99	$2,798.00
Customer 2	260	$16.99	$4,417.40
Customer 3	320	$13.99	$4,476.80
Customer 4	380	$16.99	$6,456.20
Customer 5	440	$13.99	$6,155.60
Customer 6	500	$16.99	$8,495.00
Customer 7	560	$13.99	$7,834.40
Grand Total	**2,660**	**$15.28**	**$40,633.40**

Now, we will change the headers name in bulk.

✂ **SHORTCUT:** Click on CTRL + A to select all values in Sheet 2

✂ **SHORTCUT:** Click on CTRL + H to display the Find and Replace Icon (or click on the Magnifying Glass Icon on the top right part of the ribbon, where you can see Find & Select)
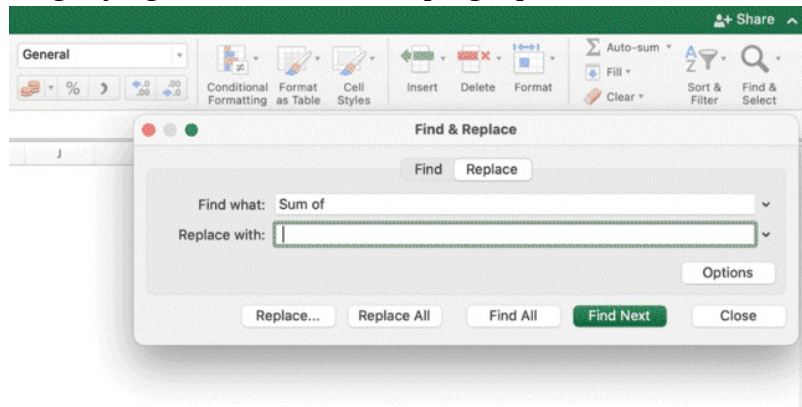
Find "Sum of " (with empty space at the end)

Replace with " " (empty space)

Given the way Excel is coded, if you don't replace the value with a space or some other character, an error message may appear to warn you that the name you are trying to create already exists, so you are not able to make this change in the name. But you need to change the header value and eliminate the "Sum of" and "Average of" from the header to get a clear readable table.

You can then avoid this problem by adding an empty space, an underscore or anything you want. Do the same thing with Average. CTRL + H > Find Average of > Replace with (empty space)

Now, select Row labels and type over CUSTOMERS

Move Pivot Table to the top of the sheet (cut and paste)

Select the entire Table

✂ **SHORTCUT:** CTRL + X to cut

Move the table to B2. <u>You will have to face a little challenge.</u> You will be able to solve it even if you have never seen it before. The challenge is that it won't allow you to cut-paste a pivot table overwriting another, but your goal is to cut-paste the pivot table in B2. Once done:

Duplicate Pivot Table (Create the second Pivot Table with copy and paste)

Select the entire Table

✂ **SHORTCUT:** CTRL + C to copy

✂ **SHORTCUT:** CTRL + V to paste a copy right below in B13

Replace Row Labels in the copied table with ITEM just by typing over it. You should be in this scenario.

From the new pivot table (ITEM), go to the field list on the right.

From the field list, drag Item into the Row Box underneath client.

You have now a breakdown of quantity and revenue for each Client and Item.

You can swap Client ID and Item within the Row box to see how the table changes

You can also collapse or show the fields within the Pivot Table with one click to show or reveal the data as you need (click on the + / - sign near Blue Shirt and Red Shirt.
✏ **NOTE:** You can filter a table by adding a field in filter (as we will show in the next chapter), swap rows and columns, and add multiple columns in the field box.
Now take Customer ID from the new table and drag it back to the field list
You have now two tables, one with Customer ID in the rows and one with Items in the rows.

✐ **NOTE:** we have done number formatting BEFORE copy-pasting the tables and change values.

This way, **I avoided creating 2 Pivot Tables from scratch and have to manually do the formatting in each column. This is a crucial step if you have a lot of tables to do, a lot of data to format and you want to avoid wasting time in formatting activities**. This is a process strategy and approach that allows you to **identify the most time-consuming tasks and just carry them out in the process when it's most convenient.**

Show Values As

Now, go to the Customer ID table, and Right-click on the Quantity column.

You will be able to see the option: "show values as" and you can select "% of grand total".

You can see how now the numerical values have changed to percentages of the total, called "Grand Total" so you can better understand how much in % each client purchased compared to the total.

As you can see, with Right-click on the column you have a lot of different options and you are invited to test them and play around until you get more familiar with the app interface
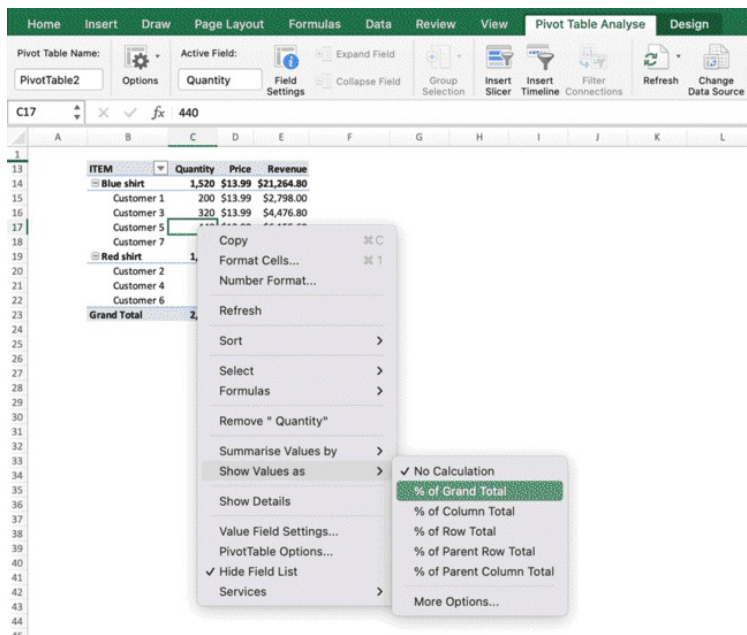
ITEM		Quantity	Price	Revenue
⊟ Blue shirt		57.14%	$13.99	$21,264.80
	Customer 1	7.52%	$13.99	$2,798.00
	Customer 3	12.03%	$13.99	$4,476.80
	Customer 5	16.54%	$13.99	$6,155.60
	Customer 7	21.05%	$13.99	$7,834.40
⊟ Red shirt		42.86%	$16.99	$19,368.60
	Customer 2	9.77%	$16.99	$4,417.40
	Customer 4	14.29%	$16.99	$6,456.20
	Customer 6	18.80%	$16.99	$8,495.00
Grand Total		100.00%	$15.28	$40,633.40

We have previously seen how to create formulas in cells, now let's have a look at how we can create formulas within the Pivot Tables.

1. Select the Pivot Table with Customer ID on the rows.
2. On the Ribbon, click "Pivot Table Analyse"
3. Click on Fields, Items and Sets
4. Click on Calculated Field
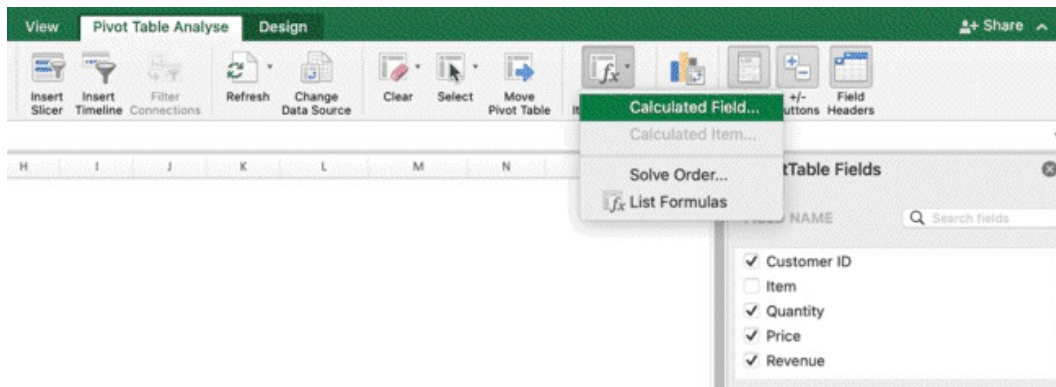
Calculated field is the name of formulas created within the Pivot Tables.
Let's suppose that each 2 ITEMS were combined in a PACKAGE, and we want to calculate how many packages we have sold. So, we will create a formula Packages = Quantity/2
✏ **NOTE:** you can create formulas before in the process as well, so you will add them to the first table, format them, and then you duplicate the table and edit it. As we are creating the formula now, if we want to add it to both tables, we will have to format it twice, once per table.
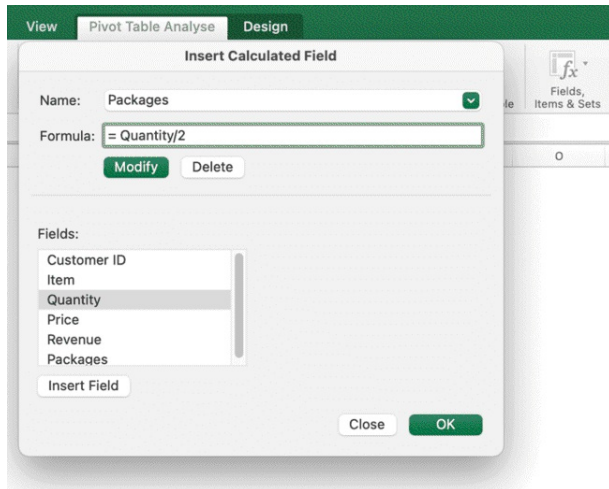
Type in the following formula, and click OK to confirm. As we have done for the previous fields, we can double click on the i icon to change the formatting style and the decimal points.

Our new calculated field has been added to the list, and we can now drag and drop it in any table we want.

If we want to edit the calculated field, we just need to click on

1. Click on the Pivot Table
2. On the Ribbon, click Pivot Table Analyse > Calculated Fields
3. Click the down arrow to reveal your field
4. Edit your calculated field and confirm
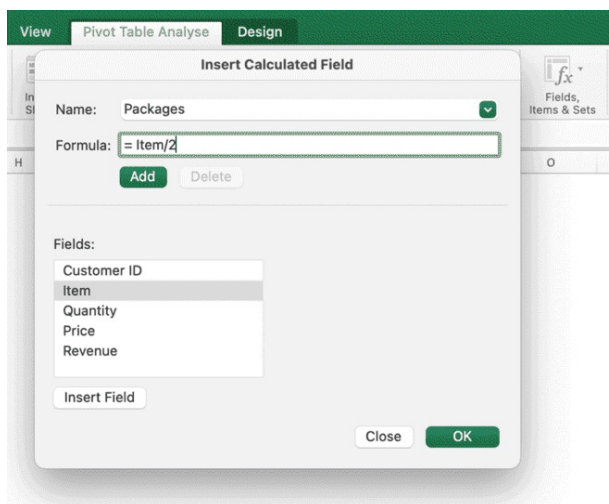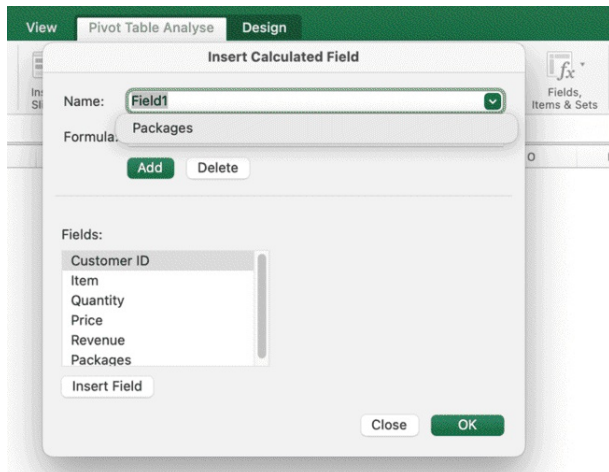
As mentioned, not everything will work as a calculated field formula and may give you some trouble, like costs and percent values, which are often tricky and needs to be calculated manually with formulas without the use of pivot table. You need to make sure you select the data you want in the table, select the operator (sum, count, average…) and double check it's working properly. If not, you may have to use create formulas or apply edits to your original file, to make sure it's ready to be used as a Pivot Table data source file. **Another workaround would be to create standard formulas near the pivot table in the spreadsheet, using values from the pivot table, <u>but outside the pivot table</u>** (it sounds complicated, but it's actually very simple: basically you will create a table and add formulas near the table, so it will look like it's a big unique table, when instead is partly a pivot table and partly just a normal table with formulas).

Pivot tables are very useful and powerful. you can use them in several scenarios to speed up your work:

data summarisation, report creation, list the unique values of any column, filter, analyze, sort,

data without writing a formula or a macro, make dynamic pivot charts (as we will see in the next chapter, transpose data (i.e. switch columns and vice versa, show breakdowns)
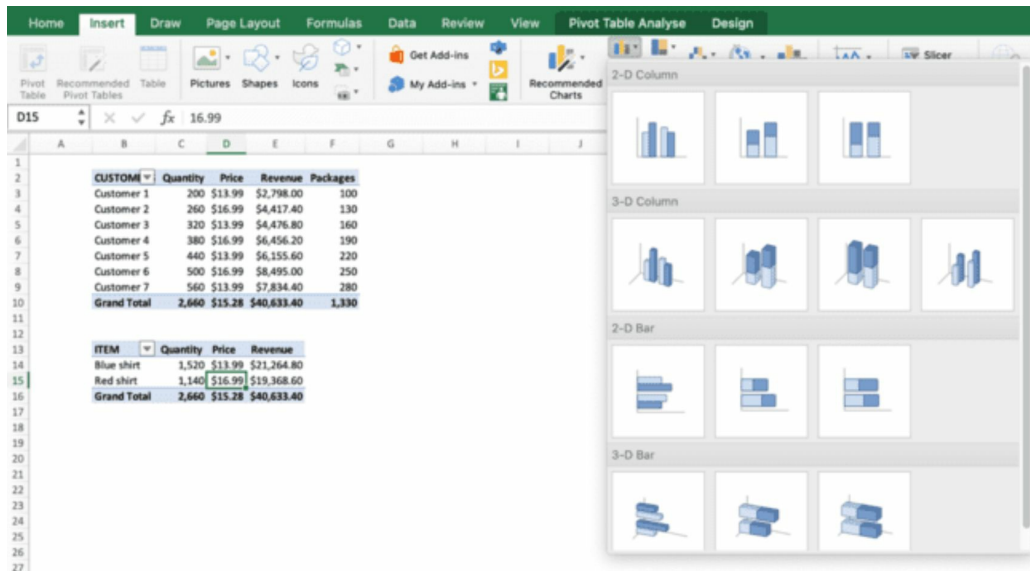
To create Pivot Tables
- Format your dataset in Table format
- Insert Pivot Table from dataset
- Add fields
- Format Fields
- Create Formulas (Calculated Fields)
- Add multiple rows, swap rows
- Use filters
- Change how you display values in pivot table
- Duplicate tables and edit when it's most convenient (e.g., post formatting)

Chapter 6: Pivot Charts

Charts are another of the fundamentals of Microsoft Excel. Nevertheless, creating and customising charts can still to these days pretty time-consuming in Excel. It's the price to pay for the very high level of customisation. I will show the basics and more to become a pro and create outstanding charts fast. The first thing you need to know is that, **the same way formulas and calculated fields are not exactly the same, charts and pivot charts are not the same either**. And while they have a lot of similarities, the way you build and edit them is slightly different. Personally, I prefer to **create charts from a normal table than a pivot table**, as it's a bit faster and doesn't give as many formatting issues as creating charts from a pivot table. But for now, we are going to start from Pivot Charts, and specifically from charts created from simple Pivot Tables like the ones in this example

1. Click on the ITEM Pivot Table
2. From the Ribbon > Insert > click on the bar chart > select the first Bar Chart

A bar chart with 3 data series will be created from the table you selected.
DATA SERIES: a column with data displayed in a chart is called Data Series.

CUSTOMERS	Quantity	Price	Revenue	Packages
Customer 1	200	$13.99	$2,798.00	100
Customer 2	260	$16.99	$4,417.40	130
Customer 3	320	$13.99	$4,476.80	160
Customer 4	380	$16.99	$6,456.20	190
Customer 5	440	$13.99	$6,155.60	220
Customer 6	500	$16.99	$8,495.00	250
Customer 7	560	$13.99	$7,834.40	280
Grand Total	2,660	$15.28	$40,633.40	1,330

ITEM	Quantity	Price	Revenue
Blue shirt	1,520	$13.99	$21,264.80
Red shirt	1,140	$16.99	$19,368.60
Grand Total	2,660	$15.28	$40,633.40
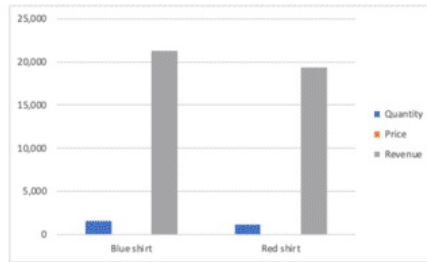
You can also obtain the same output if you

1. Click on the pivot table
2. From the Ribbon: Pivot Table Analyse > Pivot Chart
3. From the Ribbon: Design > change chart type
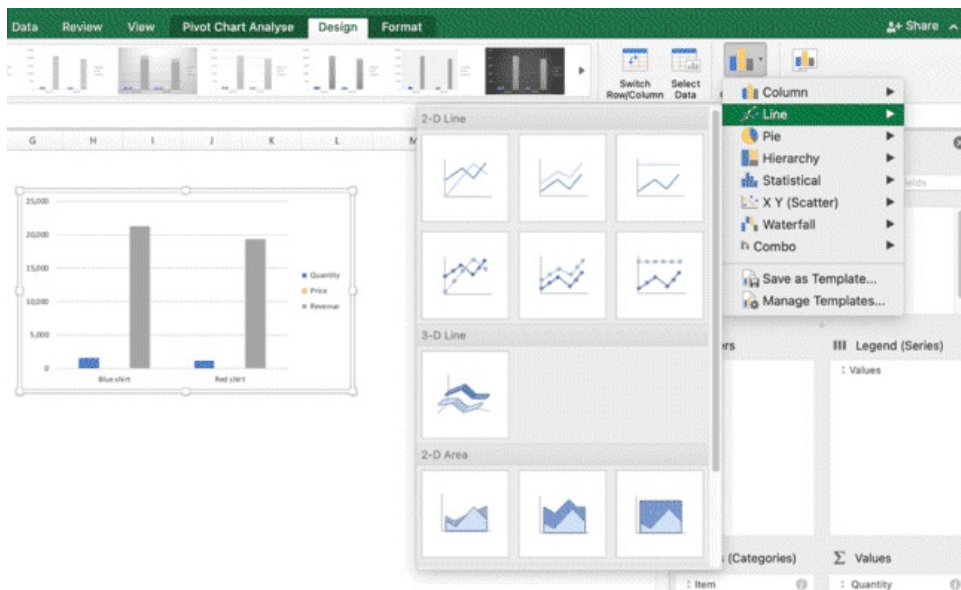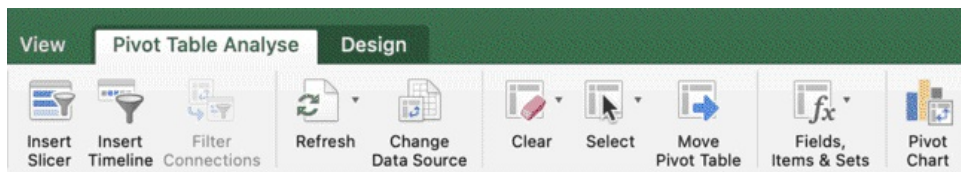
Customise Pivot Charts

I will now show you the basics of chart customisation, extremely important for reporting & dashboards

1. You can click on the graph and move it around
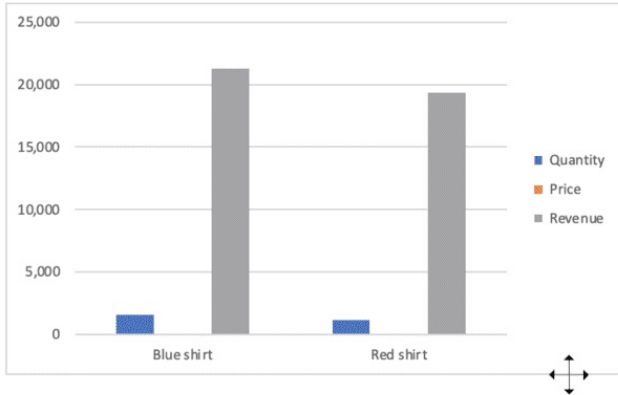
2. You can click on the graph border or corner and resize it (hold SHIFT to resize it while maintaining proportions)
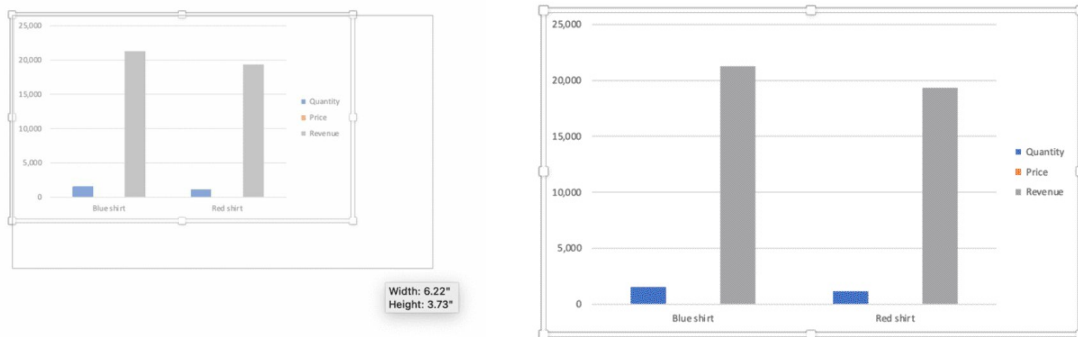
3. You can click on the legend, the X-axis or the Y-axis and add bold formatting, increase or decrease the character size (using the buttons A ◆◆ A ◆◆)
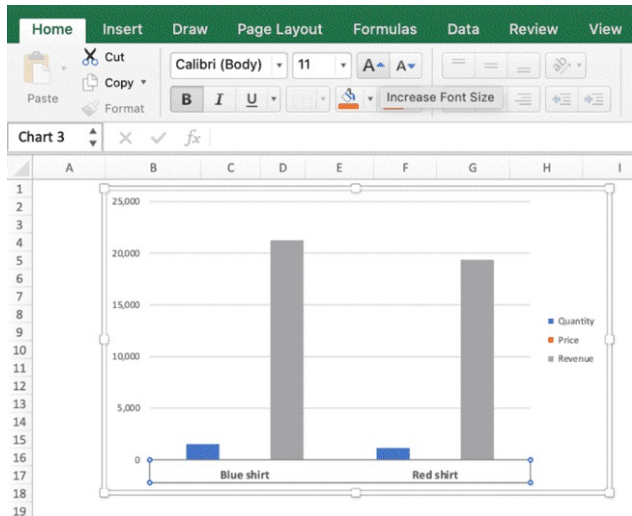
You may have noticed that when you click on the chart, the Ribbon has changed as well.

You now have "Format", near "Design" and "Pivot Table Analyse".

These sections will allow you to customise the chart look and the chart data.

1. Right click on the data series
2. Click on format data series
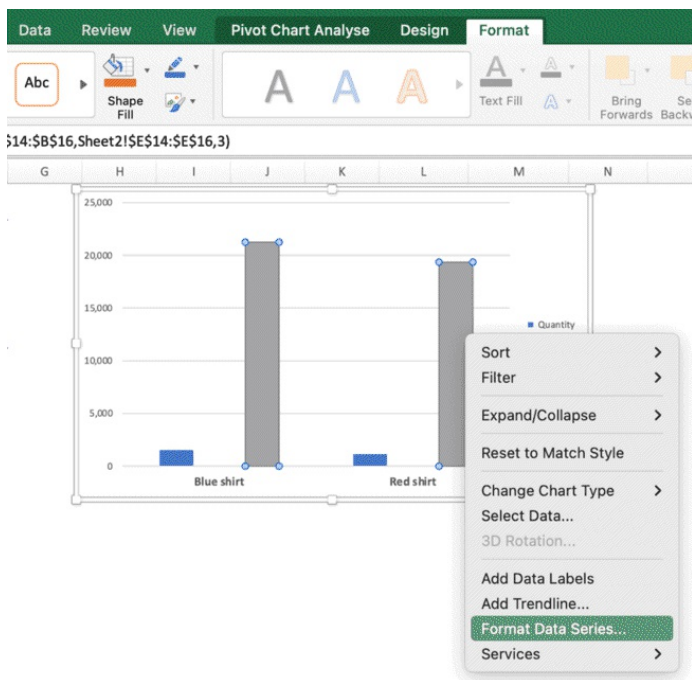
Our goal will be to get to a final result as the following, which is much clearer and user-friendly.

This is quite a time-consuming process, **but learning how to create slides and presentations through Excel is a must have skill for professionals.**

When it comes to analysing data, being able to present them in a clear way to clients and stakeholders is a key part of the process. Therefore, the ability to create high quality charts in your presentation is an absolute must within your data analytics process.

But the good news is that I will show you exactly the best strategies to improve your chart, the fastest way possible and how to optimise your work.

PRO: it allows a lot of different customisation options and it's very flexible

CON: obtaining high quality design is time consuming and there are not a lot of user-friendly templates to create beautiful visualisations, therefore you will have to do quite some manual work even if you start with a template.

If if you click on a data series and then try to change colors or use one of the Excel templates, you will be quick to realise that the app is definitely not optimised for presentation. The default color palettes look pretty vintage, so as the chart types you can select from within the Design tab in the Ribbon (for instance, in the below chart, the labels have been added automatically, but as you can see they would need to be improved with manual work – color – size – position…).
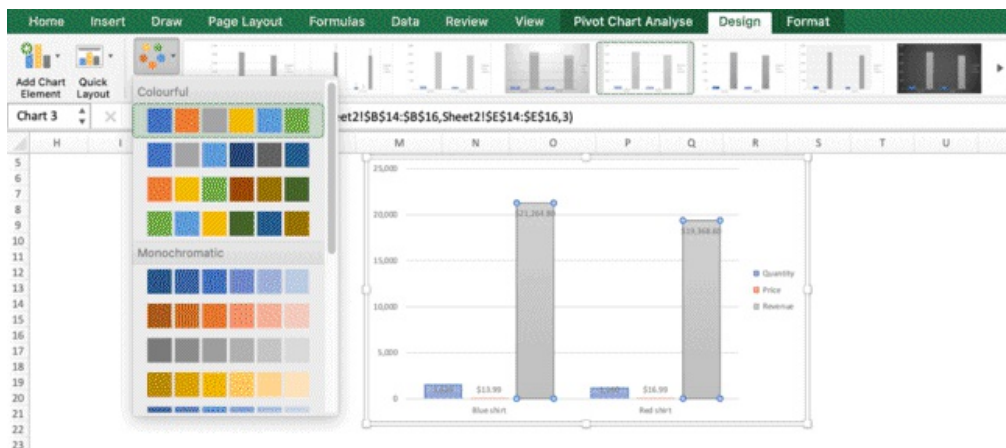
On the right, a new section "format data series" should appear near the Pivot Field list.
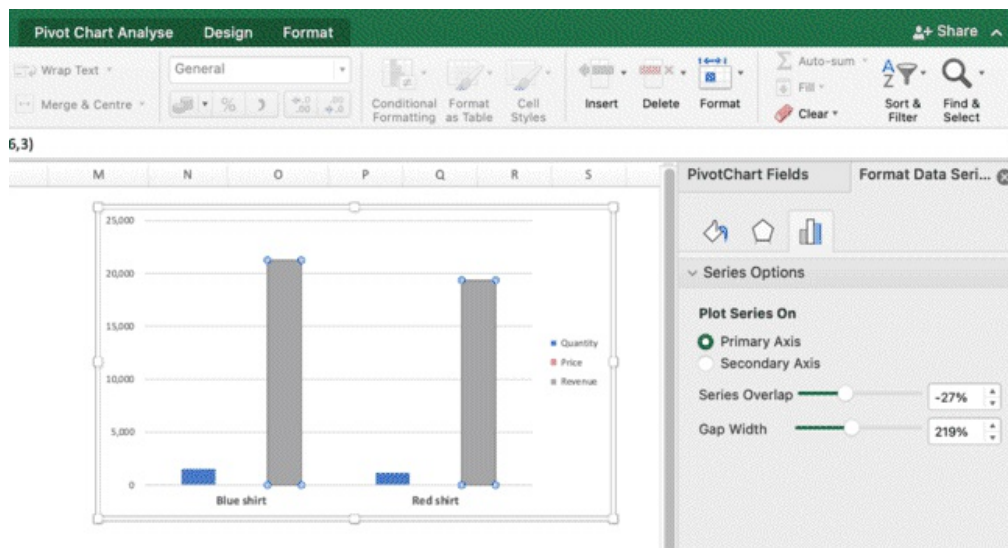
You can use this section to

1. Change the axis of the selected series, in order to improve the chart
2. Change the series overlap, which is how the series selected will overlap with one another
3. Change the gap width (increase or decrease) between series

The Format Data Series section has 3 subsections. One for axis (1), one for shadows and effects (2), one for fill and border color. We will cover section 1 and 3, which will be more than enough to create beautiful charts and we will let you explore the shadow section (which is not among the most important things to know when it comes to charts in my opinion: I always use a clean minimal style for my charts.

You can't go wrong with it, and it will never go out of style)

Section 1   Section 2   Section 3
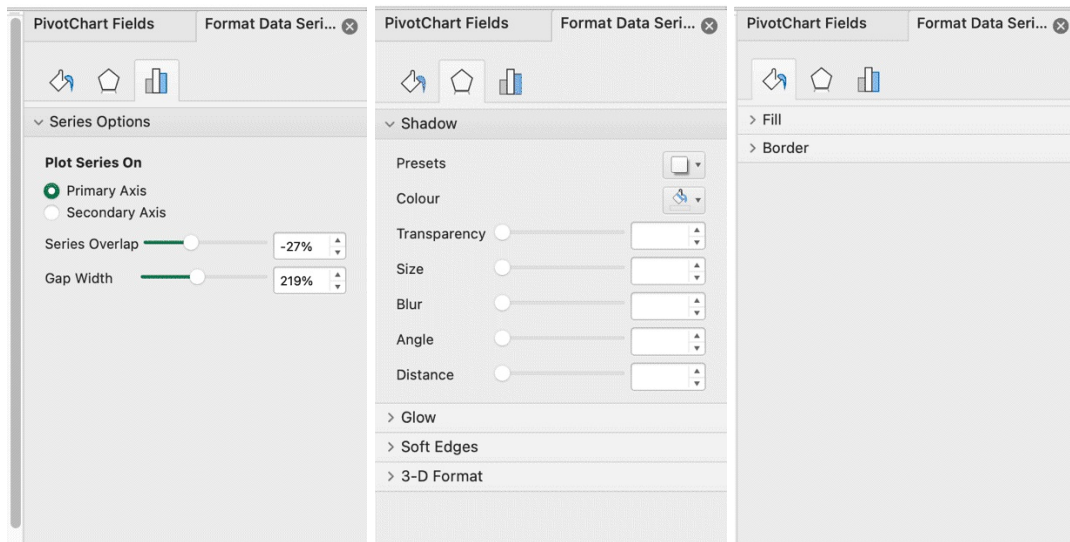
Select the following parameters for the first data series.
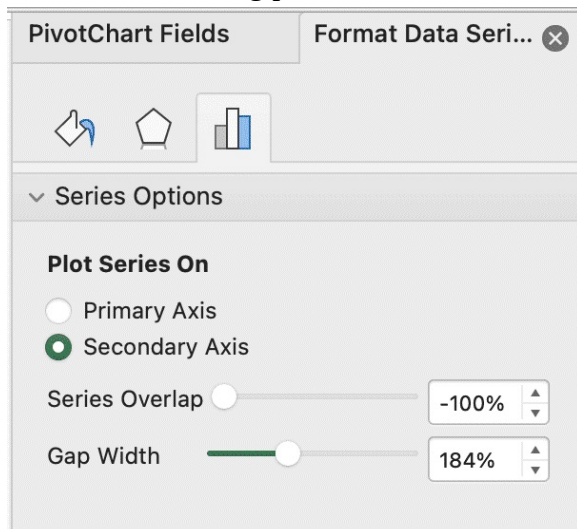
And you will get the results as in the picture below. If you have multiple bars in the same chart, you will have to play around with this tab for each of the series, in order to find the best configuration.

In fact, some versions of Excel make even the simple process of having multiple bars in a chart quite tricky. The bars may overlap and you will have to manage this process manually.
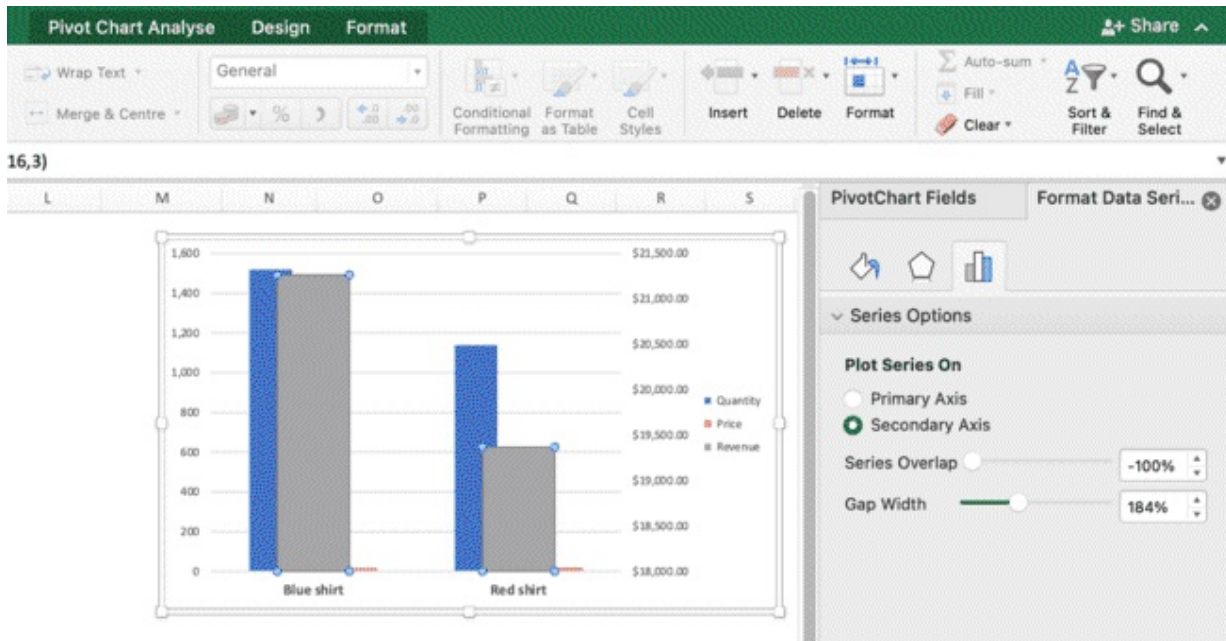
We have already done the exercise and we will tell you the final numbers. We will also show you the difference between Pivot Charts and Charts later in the chapter.

✏ **NOTE:** if you are struggling with series overlapping, try to reduce the number of bars per chart or switch to line chart or area chart, where you won't have overlapping issues.
Select the 3 series, one at a time, and write the parameters as below.

	Quantity	Price	Revenue
Series Overlap	-100%	-100%	-100%
Gap Width	185%	398%	185%
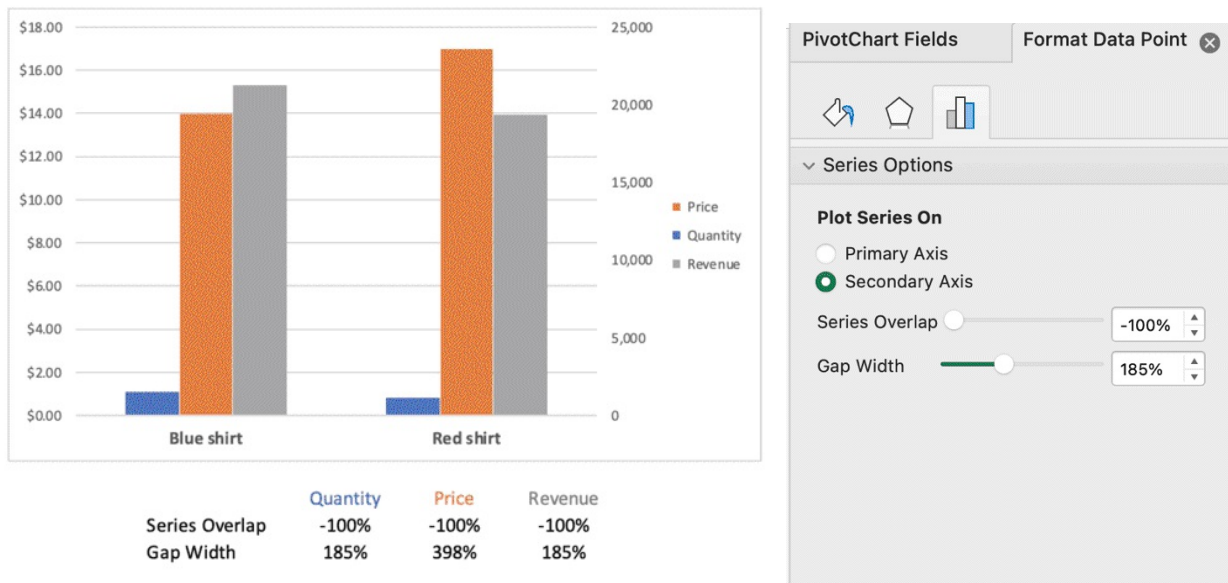
The second section has a paintbrush symbol. Within this section, you will be able to customise fill an

d border and improve the look of your chart

In this example, you can change, for both series

1. The border color
2. The border width (e.g. 1.75 points)
3. The background color, by selecting Solid Fill
4. The background transparency (60%)

Select one series at a time. Under fill add 60% transparency
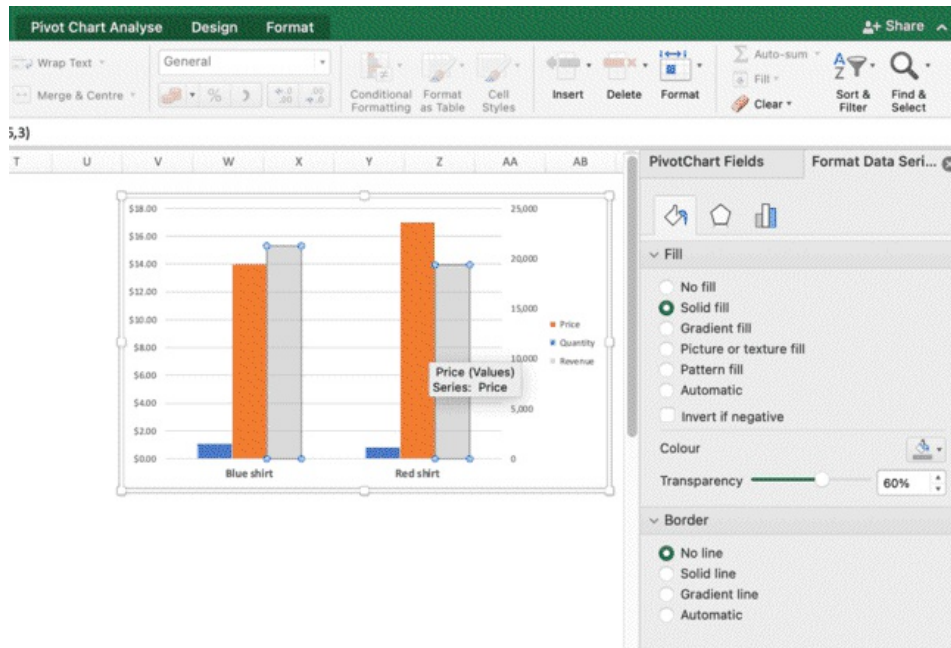
Under border, change the color to black and add 1.5 points
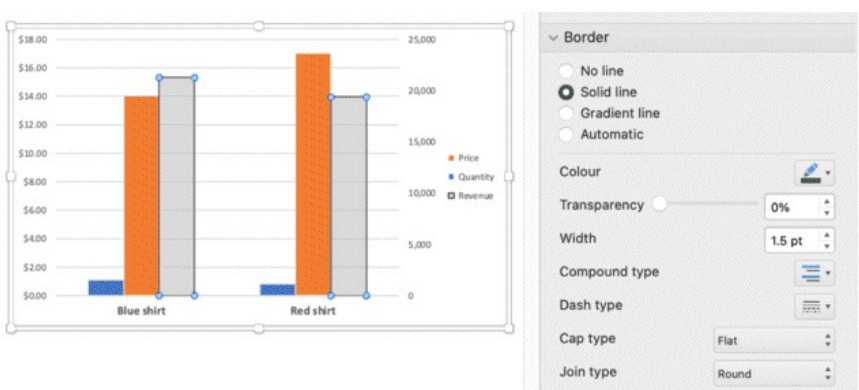
Repeat the same process for each of the series and you will have this result (you can change the colors as you prefer) and this is going to be your final result.
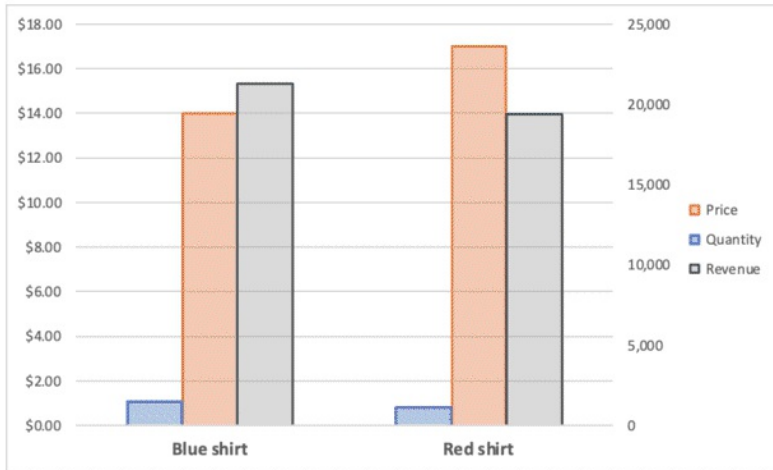
When we create a chart from Excel, the starting point is pretty basic and messy at times, but just by changing axis, colors and transparency, you can easily create pretty, minimal charts in no time.

Let's resize the chart. Put the cursor on the vertical right side, hold and drag to the right.

You can also click on one of the corners, hold SHIFT and drag to increase size without changing the proportions. The same chart can look very different, so you need to find the best size, proportions, and how to place them in your spreadsheet with other charts and text.
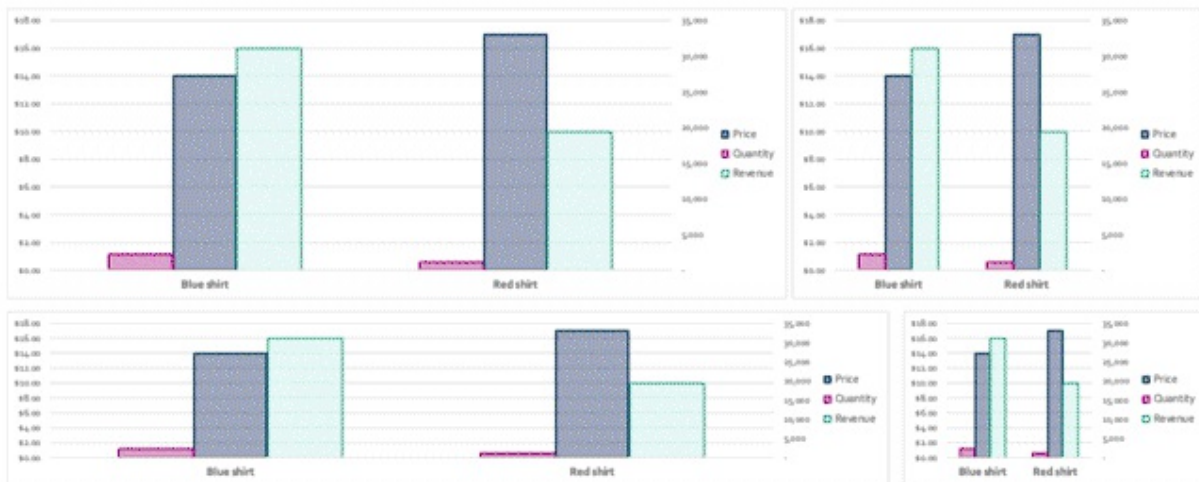
✎ **NOTE:** the basics of charts are creating simple charts, even with no border or transparency, just nice clean consistent colors, the right proportions, and making sure they are simple and readable. Master the basics of design and make sure you adjust and prepare for the person that will look at charts and tables, small details can make a big difference in client communication, possibly more than you may think.

Let's add a title to the chart.

- Click on the chart area or border (not on the series)
- On the top left corner of the Ribbon, under Pivot Chart Analyse > Design > Add Chart Element
- Select Chart Title > Above Chart
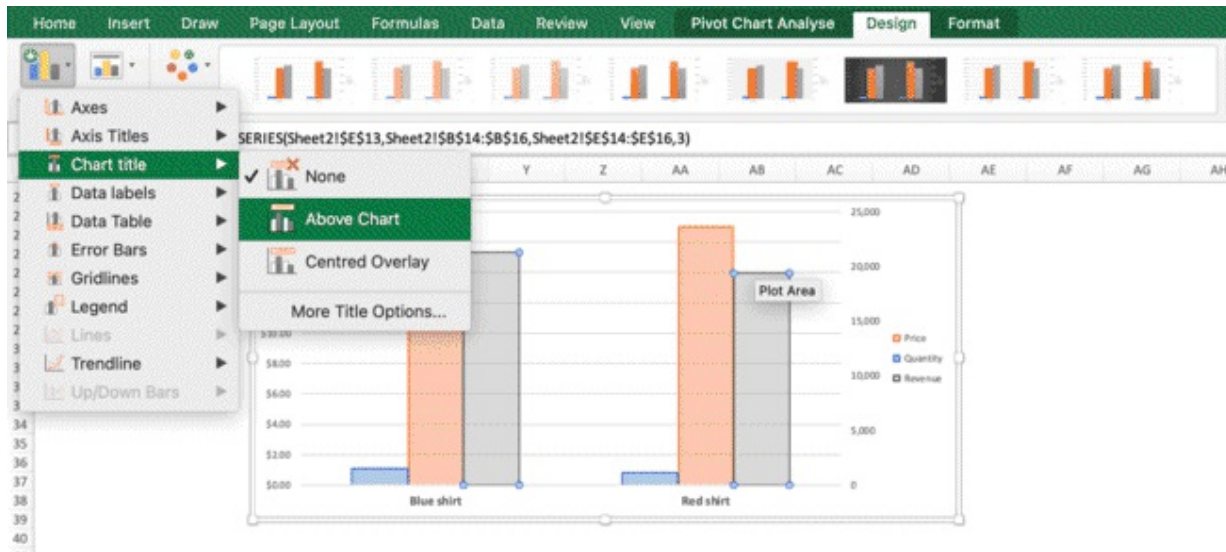
Double click on the title to edit. Use the formatting options in the Home tab as usual
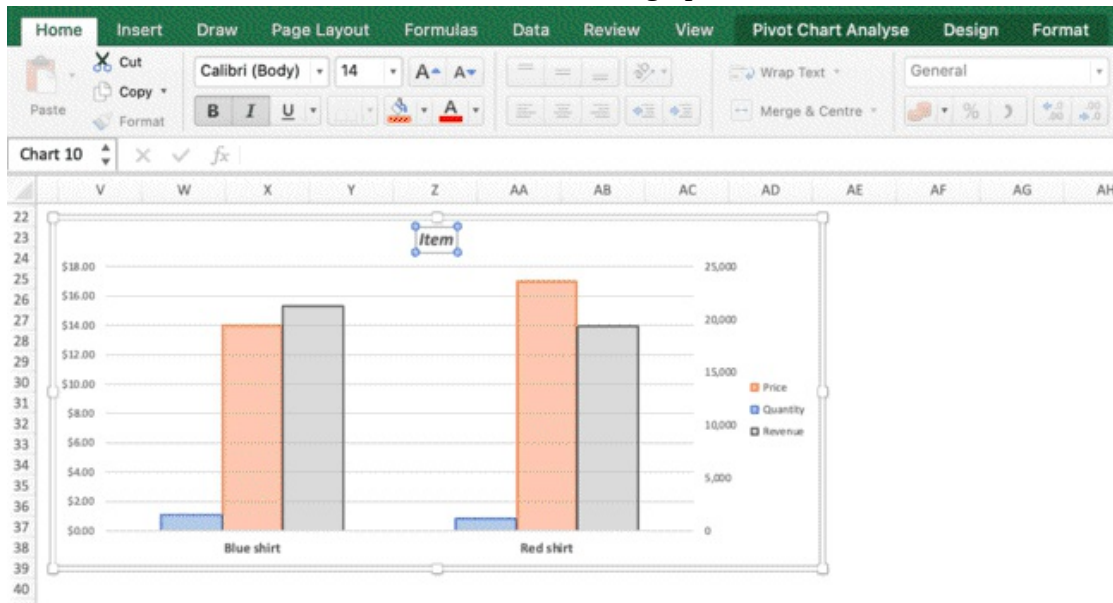
Now let's place the legend below the chart. To do so, right click on the legend > Format Legend
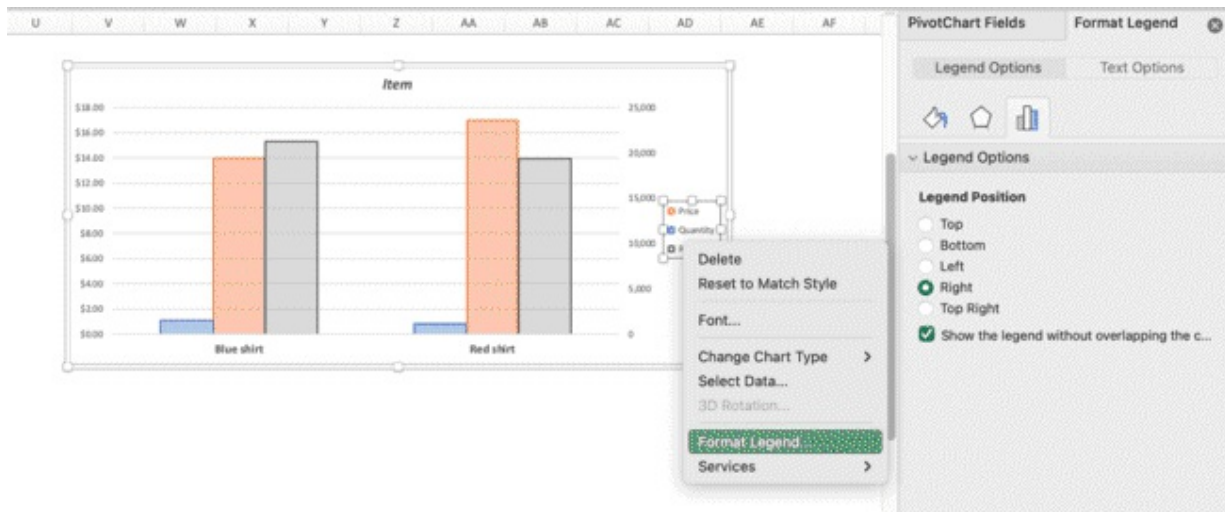
The panel on the right side will now show the customisation options for the legend, split in 3 sections.

Click on Bottom to place the legend on the bottom
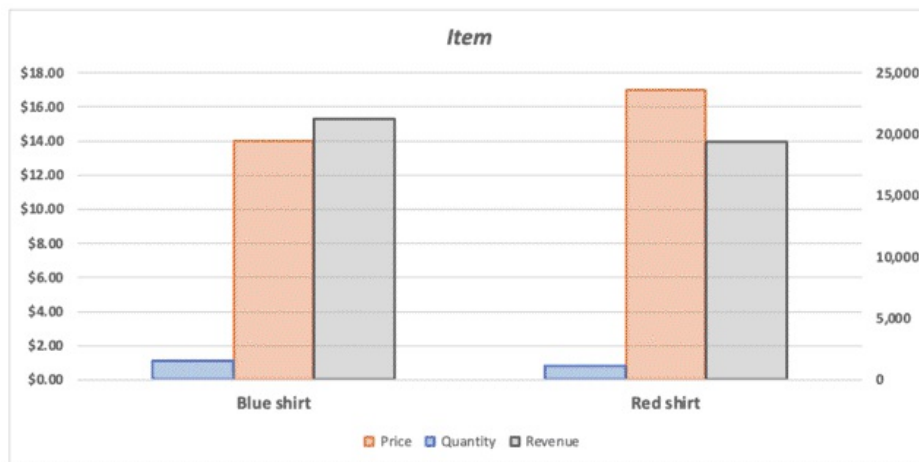
Let's add the labels. Right-click on a data series > Add Data Labels
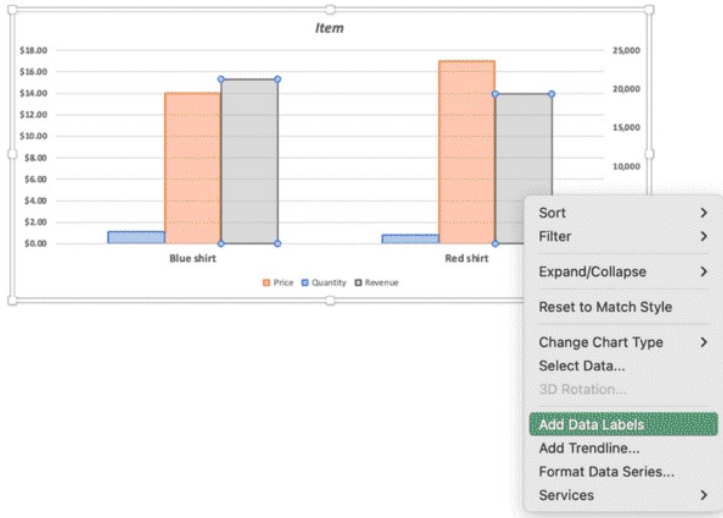
Once you add data labels to all the series you need, you can double click on the labels and customise them within the Home Tab, as usual
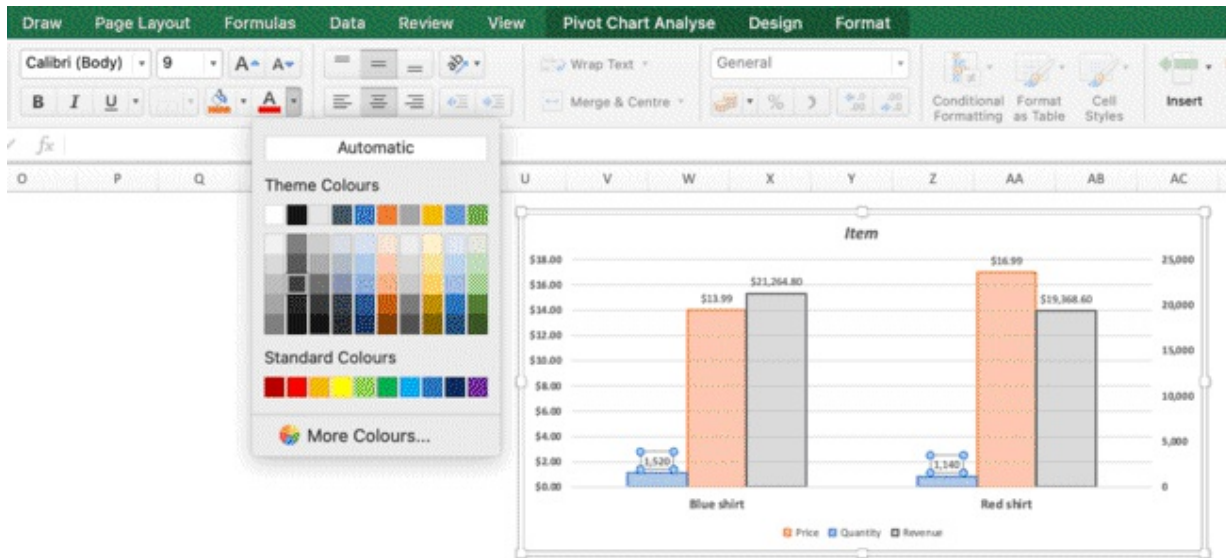
Or within the Panel on the right side of the screen, where the panel will have a data label section.
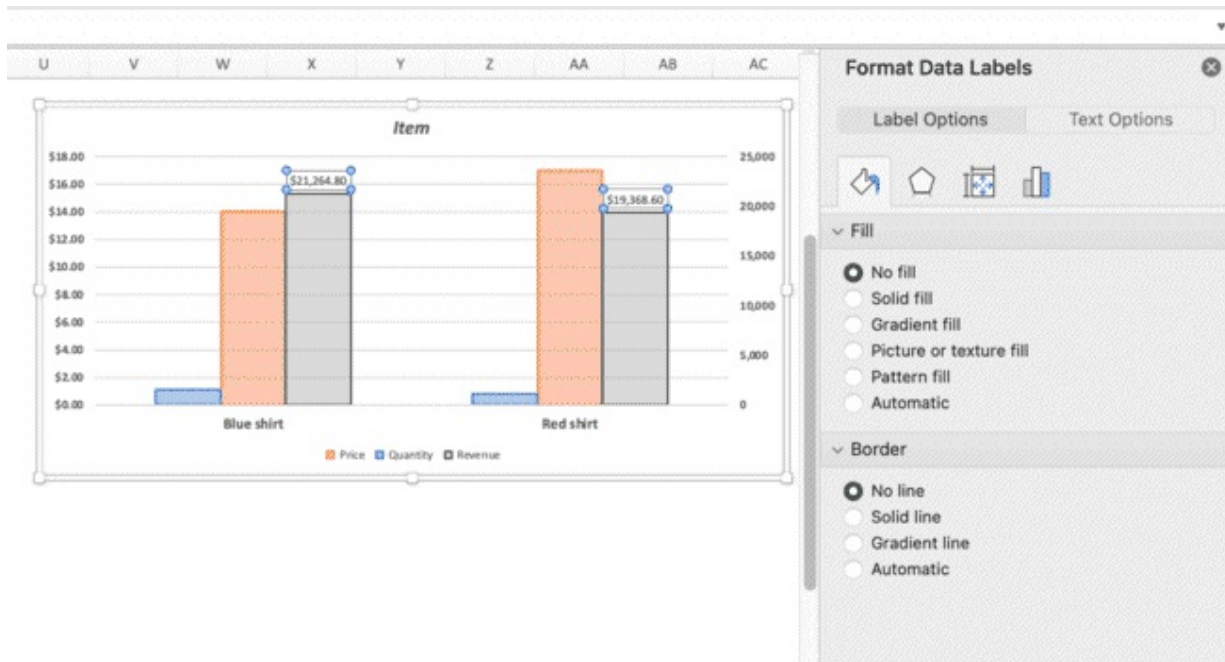
You can drag & drop Price in the Row Box (Field List), to get your new metrics automatically added to the pivot chart. The same way you can remove fields from the Pivot Table to get it reflected in the Pivot Chart.

Let's remove Quantity from the table

- We can untick it from the field list
- Or we can drag it back from the Values box to the field list
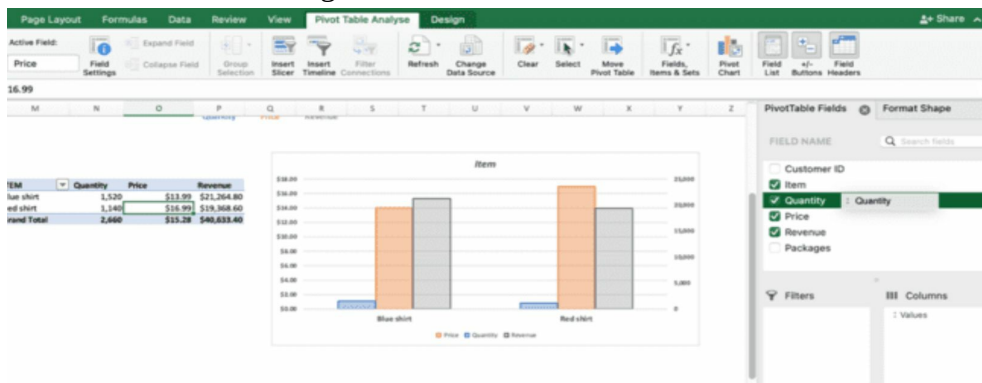
One of the reasons why it's preferable to create charts from data and not Pivot Charts, is that every time you drag and drop fields in an out of the field list you may lose some formatting settings both in the Pivot Table and in the Pivot Chart. This is how they will look like after we remove Quantity.

As you can see the background color where there was the quantity column went from white to No Fill, and we also lost one axis in the Pivot Chart

ITEM	Price	Revenue
Blue shirt	$13.99	$21,264.80
Red shirt	$16.99	$19,368.60
Grand Total	$15.28	$40,633.40
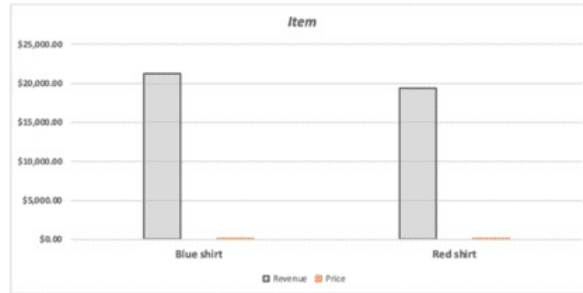
You are going to learn how to avoid this type of problem, but for now, let's recap the entire process that we learnt so far:

RECAP

1. Get a data set
2. Transform it into table format by selecting it and use the shortcut CTRL + T
3. Click anywhere in the table and select > Insert > Pivot Table
4. Drag & drop the fields from the field list to the boxes on the right side of the screen
5. Format numbers, add calculated fields, change "show" as if needed
6. Right click on a column in the Pivot > Show value as if you need to change it
7. Click on the Pivot Table > Insert > Chart
8. Customise the chart through the formatting options in the Ribbon (Pivot Table Analyse, Format, Design) or double click on the data to open these options
9. Add or remove fields in the Pivot Table to edit the linked Pivot Chart automatically

✏ **NOTE:** Pivot Chart work best when the table has one, two or maximum three values. It's just easier to manage changes and visualise data. You can definitely add more, but the more you add, the more the chart may be difficult to read, and the less the Pivot Charts will become flexible. So, while you may be working on a chart to simplify the visualisation, you may end up having some issues in customising the chart and keeping it looking clean. So, keep it simple. Start from the basics.

Now, let's take the Pivot Table "Item" and let's add Customer ID in the related Filter Box.

You can now filter the Pivot Table and the Pivot Chart just by selecting items on the filter.

You can add as many filters as you want in order to dig deep in your data as you need.
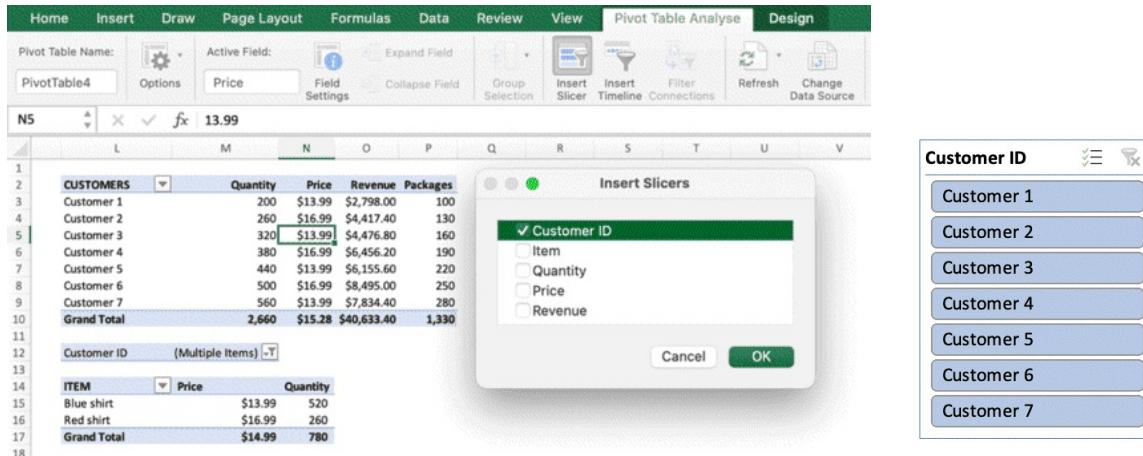
Interactive Dashboards

We are now going to learn a super-handy command that will allow you to analyse your data in no time.

We will create interactive filters to change the chart and the table interactively.

Click on the "Item" Pivot Table and click from the Ribbon: Pivot Table > Insert Slicers.

From there, click on Customer ID to insert it.

The slicer is an interactive filter that will allow you filter the table (and all the tables you will link to the filter) with one click. You can add as many slicers as you want and use them in combination.

The main goal of this will be to create a dashboard with tables and charts, add the filters, and being able to sort through the tables and charts in a few clicks.

Now that you have added a slicer, just place it on the right.

If you click on any client within the slicer, you will see the Pivot Table and the Pivot Chart changing in real time. But the second table is not changing.
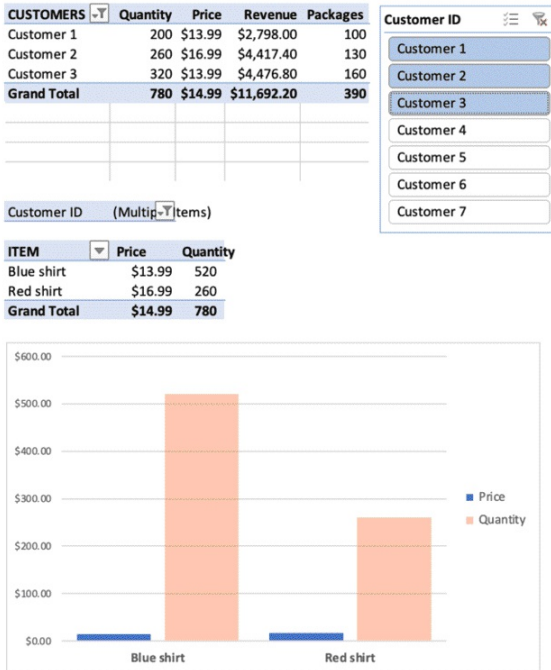
This is because you have to connect it to the filter to the table.

✏ **NOTE:** You can create a slicer from a Pivot Table, but if you have more than one Pivot Table, you have to manually connect / disconnect each slicer from the table.

1. Right click on the slicer
2. Click on Report Connection
3. Tick the second pivot table
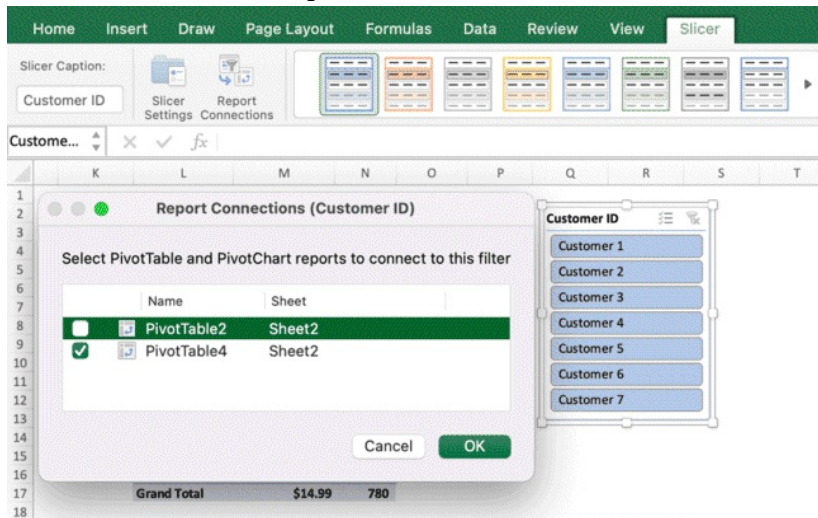
Now you can analyse both the tables with one click.

You have just created your first basic interactive dashboard. The Pivot Table with Customer is now changing based on the options selected in the filter, so as the Pivot Table with Item and the

linked Pivot Chart.
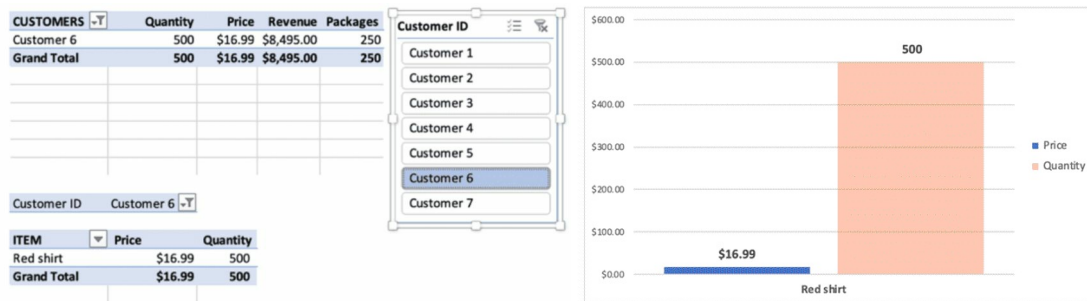
As previously mentioned, an important aspect of the Pivot Tables, consists of automating the process and creating a re-usable structure that you can update over time and see the data changes without having to do everything from scratch.

This process has to be done carefully though, as any small error in the procedure will prevent you from going forward and, let/s be honest: Excel error messages and troubleshooting procedures are not the most user-friendly, so we will now cover the fundamental steps you need to take to ensure you can re-use your templates over time without spending too much time fixing data issues.

Add another slicer, move the table and the charts around to improve your dashboard.
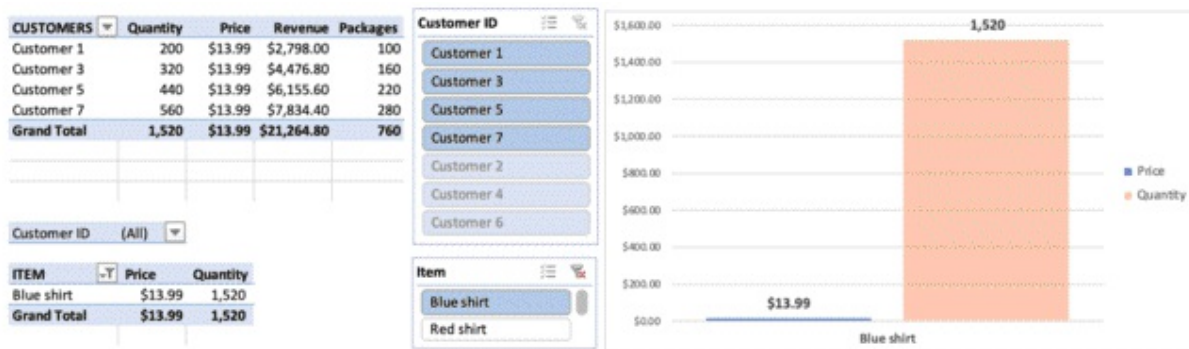
So far, we have built
1. A data source in table format
2. A Pivot Table
3. A Pivot Chart
4. Slicers to filter the table
5. An interactive dashboard with multiple tables, slicer and a chart

Let's assume that we are now in week 2 and we need to update our data source (Sheet 1) and get our tables and charts ready to analyse the weekly data.

Let's assume that we have two new customers, here named Customers 8 and Customers 9.

Customer ID	Item	Quantity	Price	Revenue
Customer 1	Blue shirt	100	$ 13.99	$ 1,399.0
Customer 2	Red shirt	130	$ 16.99	$ 2,208.7
Customer 3	Blue shirt	160	$ 13.99	$ 2,238.4
Customer 4	Red shirt	190	$ 16.99	$ 3,228.1
Customer 5	Blue shirt	220	$ 13.99	$ 3,077.8
Customer 6	Red shirt	250	$ 16.99	$ 4,247.5
Customer 7	Blue shirt	280	$ 13.99	$ 3,917.2
Customer 1	Blue shirt	100	$ 13.99	$ 1,399.0
Customer 2	Red shirt	130	$ 16.99	$ 2,208.7
Customer 3	Blue shirt	160	$ 13.99	$ 2,238.4
Customer 4	Red shirt	190	$ 16.99	$ 3,228.1
Customer 5	Blue shirt	220	$ 13.99	$ 3,077.8
Customer 6	Red shirt	250	$ 16.99	$ 4,247.5
Customer 7	Blue shirt	280	$ 13.99	$ 3,917.2
Customer 8	**Blue shirt**	**399**	**$ 13.99**	**$ 5,582.0**
Customer 9	**Blue shirt**	**299**	**$ 13.99**	**$ 4,183.0**

1. First, if you have created slicers, <u>you have to manually disconnect them from all tables otherwise</u> the **REFRESH** data procedure will not work, and the data will not be updated neither in the pivot and in the chart (each slicer has to be disconnected from all the tables)
2. You can copy-paste the new data in Sheet 1. This is the new data source you have to analyse
3. Normally, you would have to select the pivot table > from the ribbon > pivot table analyse > **CHANGE DATA SOURCE** > manually select the data source in Sheet 1, ensuring the new pivot table range covers the entire data set, as the data in week 2 may contain more records than week 1. But, as we formatted our dataset as a table BEFORE creating the Pivot Table, we can skip this procedure. **Normally, you would have to click on every pivot table**, right click > change data source > go to Sheet 1 and select the data source for each table
4. Click on a Pivot Table > from the ribbon > Pivot table analyse > **REFRESH**
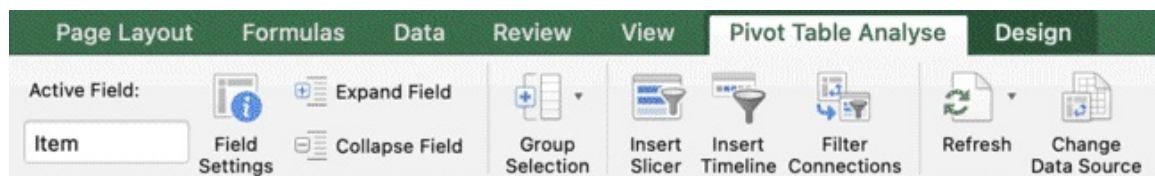
5. Re-connect all the slicers (Report Connection > thick the tables one by one)
   Notice how the chart and the tables have been updated in a few clicks.

CUSTOMERS	Quantity	Price	Revenue	Packages
Customer 1	200	$13.99	$2,798.00	100
Customer 2	260	$16.99	$4,417.40	130
Customer 3	320	$13.99	$4,476.80	160
Customer 4	380	$16.99	$6,456.20	190
Customer 5	440	$13.99	$6,155.60	220
Customer 6	500	$16.99	$8,495.00	250
Customer 7	560	$13.99	$7,834.40	280
Customer 8	399	$13.99	$5,582.01	200
Customer 9	299	$13.99	$4,183.01	150
Grand Total	3,358	$15.12	$50,398.42	1,679

ITEM	Price	Quantity
Blue shirt	$13.99	2,218
Red shirt	$16.99	1,140
Grand Total	$15.12	3,358

✏ **NOTE:** you have to disconnect the slicers (Slicer > Report Connection) before refreshing the data

✏ **NOTE:** formatting your data set into a table with CTRL + T before creating the pivot table will avoid you manually changing data sources to all your Pivot Tables.

So, to recap:

The pivot tables are dynamic tables connected to a data source. When you update the data source, you need to change the data source within the pivot, unless you format your data source as a table first. You then need to **REFRESH** the pivot table so they will read and show the updated data. If you have added slicers to create an interactive dashboard, you need to disconnect them, **REFRESH**, and reconnect them.

Important: when you create a Pivot Table from a data source, ensure the data source has

- no empty columns / rows
- no total / subtotal rows
- each column has to have a header

We will talk more about this when you will learn about data cleaning, where you will learn how to clean your raw data file before starting to work.

Pivot Tables Tips & Tricks

Subtotals

If you click on the Ribbon > Pivot Table > Design, you can hide and show totals / subtotals, change the tables styles or create a new style.
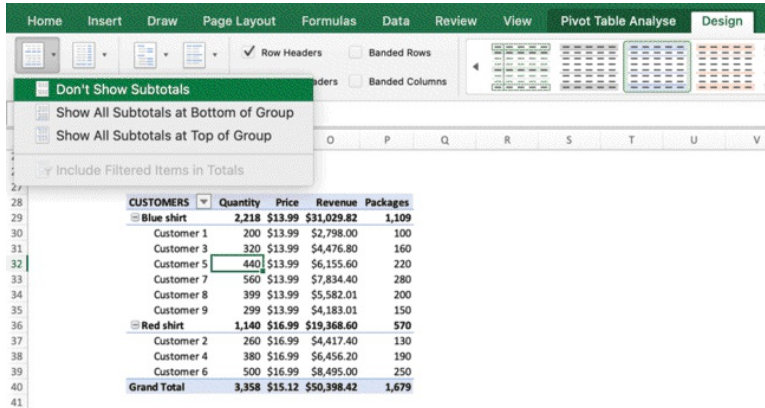
CUSTOMERS	Quantity	Price	Revenue	Packages
Blue shirt				
Customer 1	200	$13.99	$2,798.00	100
Customer 3	320	$13.99	$4,476.80	160
Customer 5	440	$13.99	$6,155.60	220
Customer 7	560	$13.99	$7,834.40	280
Customer 8	399	$13.99	$5,582.01	200
Customer 9	299	$13.99	$4,183.01	150
Red shirt				
Customer 2	260	$16.99	$4,417.40	130
Customer 4	380	$16.99	$6,456.20	190
Customer 6	500	$16.99	$8,495.00	250
Grand Total	3,358	$15.12	$50,398.42	1,679

The pre-made styles are not the most modern design you would find, and customising tables in general is not fast and easy, on the contrary the colors are standard and not very modern, but you do can create beautiful visualisaton, with a simple, modern style.

Also, I will show you a trick to access to better colors in seconds.
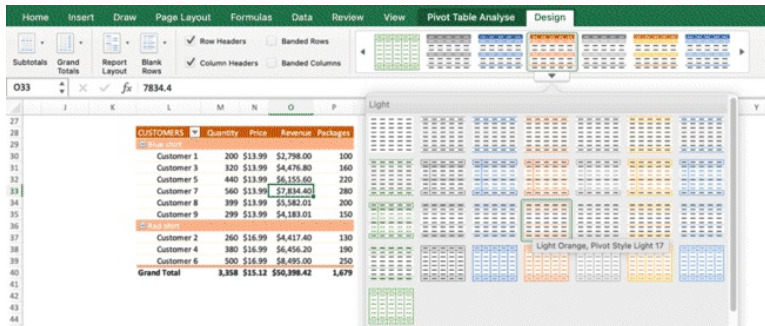
Subtotals – Understand how to summarize your data

As previously pointed out, we can see that one of the fields we added (price) is giving us problems when it comes to totals. In fact, the prices we input at the beginning are from $20 to

$40, but if we look at the totals in the Pivot Table we can see $144, which is the SUM of all the prices.

But, when it comes to Prices, you don't want the total price value displayed as the sum of all the prices, and you don't want to leave it there as it's not the correct number.

In this case, you can hide all the totals and manually recreate all the formulas manually or you can simply select the total price cell, and change the font color to white (or to any other color to make it disappear in the background). You can't manually edit any number in a pivot table, that's why you need to become a bit creative and find out workarounds when some issues with the pivot structure cannot be easily solved.

Filters

We have covered early how you can filter tables by adding filters and play around with the options, how we can filter pivot tables by dragging and dropping a filter in the Pivot Boxes, and filter the interactive dashboard with slicers. We will now look at another way to filter through data (it works with standard tables and pivot tables)

Click on the filter arrow in customer ID table, click on Filter by value > Less than > input a value and press OK.

You have now filtered the table and added a minimum value.

You can also do it from fields you added in the field list > filter

◆◆ Undo action with CTRL + Z.

When you have a large data set to manage, you can start analysing it by simply
- sorting the columns
- filtering the columns

These 2 simple tasks combined in different order, will allow you to have an immediate first fast understanding of your data before starting.

You can see through the data, looking at the unique values for each column in the filter box, you can sort data in ascending or descending order, by color, or adding conditions.

You can also filter one column and dig deep in your data by analysing the other columns

Conditional Formatting

Conditional Formatting is another very handy Excel feature, it allows you to select any data table and highlight specific cells that meet certain conditions.

So, for instance, if you have a large data set you may want to highlight only the cells where Revenue is above a certain value. Or maybe you want to highlight the top 10% cells with the highest revenue, bottom 10% with the lowest margin, or specific cells that include string values. Conditional formatting allows you to do all of this and more.

1. Select the data range you want to apply conditional formatting to
2. Click on Conditional Formatting on the ribbon (right side in the Home tab)
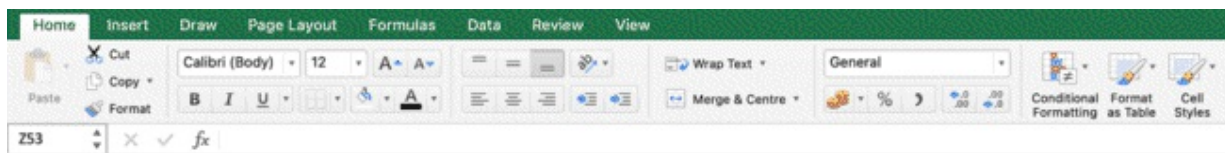
You can highlight cells that contain duplicate values, a specific value, or highlight cells that meet specific criteria, such as greater than, lower than, equal to a specific number, top or bottom values, and even add data bars.

Select the column Quantity

Click on Conditional Formatting > highlight cell rules > above average
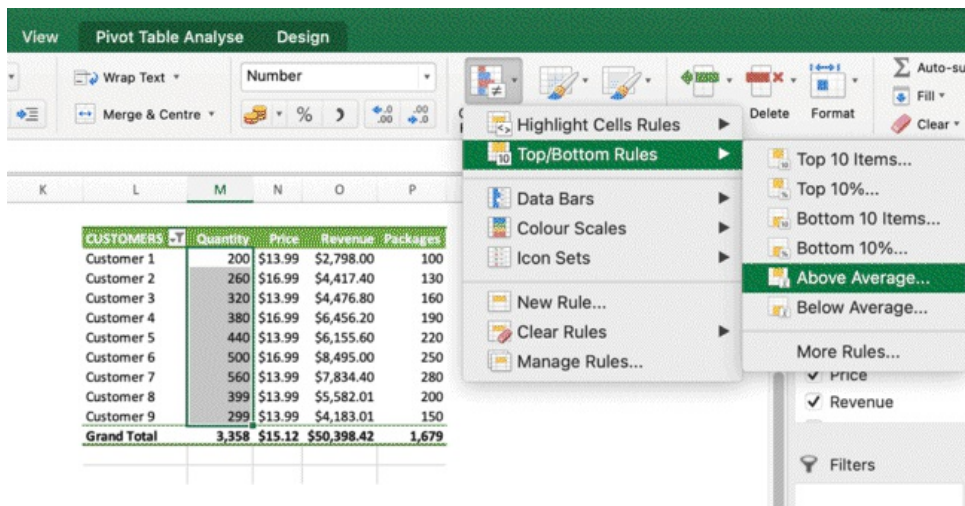
Select the green style or create a new style (the default red color for conditional formatting is very flashy and red it's generally associated with errors, that's why we need to change it for a better data representation).

Now select the Revenue column (excluding headers and totals) and click on Conditional Formatting > Data Bars > Solid Fill
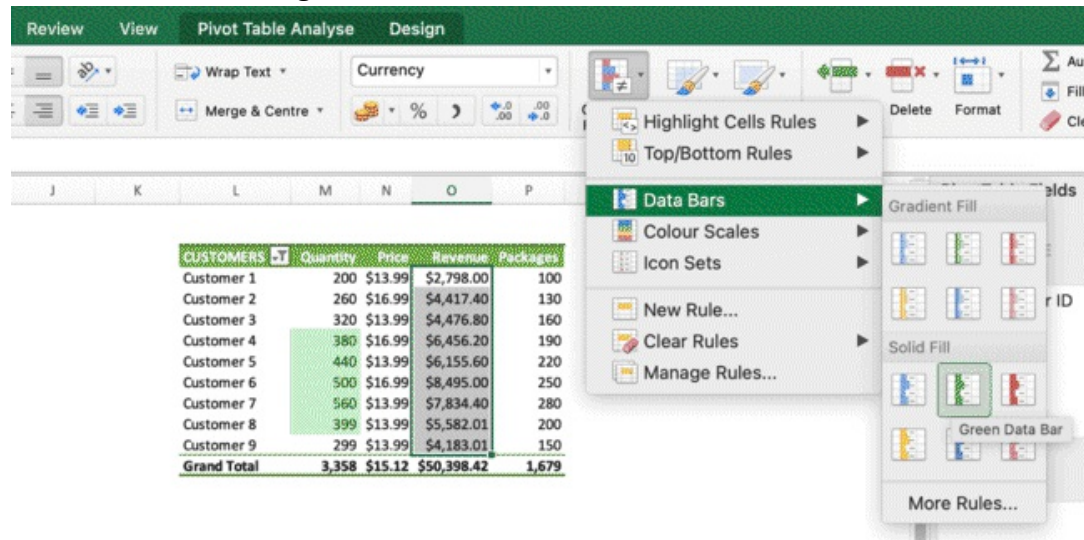
You now have bars within the table and have also a better data visualisation.

Click on Conditional Formatting > Manage Rules > select the bar rule > change the color to purple > add max value equal to 0.5 and press enter to reduce the distance between the bar and the right border of the cell.

Now select the entire table > Conditional Formatting > Clear Rule > clear rule from the selected cells to remove any formatting.
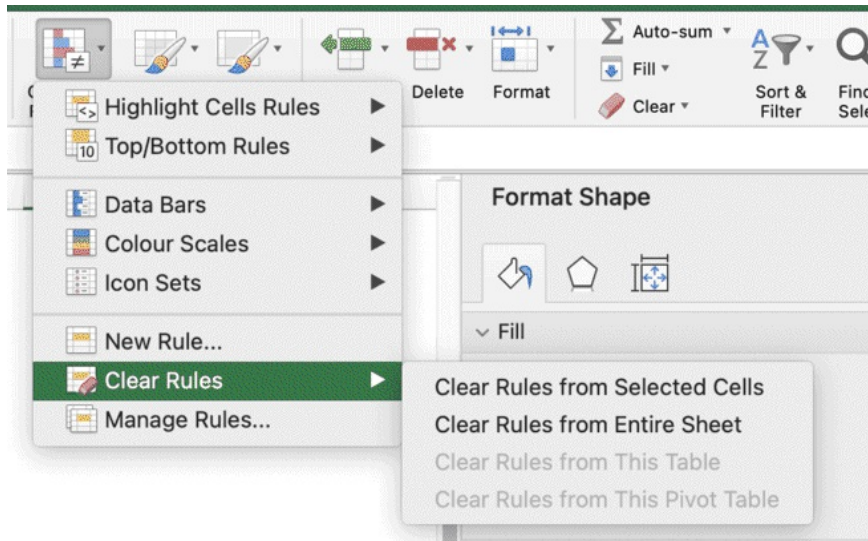
Et voila'!

Conditional formatting is a very important tool that allows you to format cells based on specific conditions. This allows you to get insights on your data at a glance and get **real time information as your data change, but your formatting rules remain unchanged.** Once you format cells and add colors, you will also be able to filter them by color when accessing to the filters.

Standard charts vs pivot charts

Let's create a standard chart by duplicating a pivot table. Select the CUSTOMERS Pivot Table.

✂ **SHORTCUT:** CTRL + C

✂ **SHORTCUT:** CTRL + V

CUSTOMERS	Quantity	Price	Revenue	Packages
Customer 1	200	$13.99	$2,798.00	100
Customer 2	260	$16.99	$4,417.40	130
Customer 3	320	$13.99	$4,476.80	160
Customer 4	380	$16.99	$6,456.20	190
Customer 5	440	$13.99	$6,155.60	220
Customer 6	500	$16.99	$8,495.00	250
Customer 7	560	$13.99	$7,834.40	280
Customer 8	399	$13.99	$5,582.01	200
Customer 9	299	$13.99	$4,183.01	150
Grand Total	3,358	$15.12	$50,398.42	1,679

CUSTOM	Quantity	Price	Revenue	Packages
Customer 1	200	$13.99	$2,798.00	100
Customer 2	260	$16.99	$4,417.40	130
Customer 3	320	$13.99	$4,476.80	160
Customer 4	380	$16.99	$6,456.20	190
Customer 5	440	$13.99	$6,155.60	220
Customer 6	500	$16.99	$8,495.00	250
Customer 7	560	$13.99	$7,834.40	280
Customer 8	399	$13.99	$5,582.01	200
Customer 9	299	$13.99	$4,183.01	150
Grand Total	3,358	$15.12	$50,398.42	1,679

Click on the notepad icon on the bottom left and select Values & Number Formatting

Paste
- ✓ Paste
- Formulas
- Formulas & Number Formatting
- Keep Source Formatting
- No Borders
- Keep Source Column Widths
- Transpose
- Merge Conditional Formatting

Paste Values
- Paste Values
- **Values & Number Formatting**
- Values & Source Formatting

Other Paste Options
- Formatting
- Paste Link...
- Paste as Picture
- Linked Picture

CUSTOMERS	Quantity	Price	Revenue	Packages
Customer 1	200	$13.99	$2,798.00	100
Customer 2	260	$16.99	$4,417.40	130
Customer 3	320	$13.99	$4,476.80	160
Customer 4	380	$16.99	$6,456.20	190
Customer 5	440	$13.99	$6,155.60	220
Customer 6	500	$16.99	$8,495.00	250
Customer 7	560	$13.99	$7,834.40	280
Customer 8	399	$13.99	$5,582.01	200
Customer 9	299	$13.99	$4,183.01	150
Grand Total	3,358	$15.12	$50,398.42	1,679

CUSTOMERS	Quantity	Price	Revenue	Packages
Customer 1	200	$13.99	$2,798.00	100
Customer 2	260	$16.99	$4,417.40	130
Customer 3	320	$13.99	$4,476.80	160
Customer 4	380	$16.99	$6,456.20	190
Customer 5	440	$13.99	$6,155.60	220
Customer 6	500	$16.99	$8,495.00	250
Customer 7	560	$13.99	$7,834.40	280
Customer 8	399	$13.99	$5,582.01	200
Customer 9	299	$13.99	$4,183.01	150
Grand Total	3,358	$15.12	$50,398.42	1,679

You have just copy pasted the same table, but only the values and the formatting (number, currency). This is now a standard table with formatted numbers, the same as the one you had created at the beginning and the same format you will get when you will receive a data source.

If we want to be a little bit more advanced, let's use a simple formula to do something different. Let's copy the table linking the cells using the simplest Excel formula. By doing so, we will be able to manipulate the Pivot Table while creating charts from a non-Pivot Table, that on top of that will adapt in real time.

CUSTOMERS	Quantity	Price	Revenue	Packages
Customer 1	200	13.99	2798	100
Customer 2	260	16.99	4417.4	130
Customer 3	320	13.99	4476.8	160
Customer 4	380	16.99	6456.2	190
Customer 5	440	13.99	6155.6	220
Customer 6	500	16.99	8495	250
Customer 7	560	13.99	7834.4	280
Customer 8	399	13.99	5582.01	199.5
Customer 9	299	13.99	4183.01	149.5
Grand Total	3358	15.115	50398.42	1679

=L28	=M28	=N28	=O28	=P28
=L29	=M29	=N29	=O29	=P29
=L30	=M30	=N30	=O30	=P30
=L31	=M31	=N31	=O31	=P31
=L32	=M32	=N32	=O32	=P32
=L33	=M33	=N33	=O33	=P33
=L34	=M34	=N34	=O34	=P34
=L35	=M35	=N35	=O35	=P35
=L36	=M36	=N36	=O36	=P36
=L37	=M37	=N37	=O37	=P37
=L38	=M38	=N38	=O38	=P38

Apply bold formatting to the headers

Select the headers in the table

✂ **SHORTCUT:** CTRL + B

Add outside borders to the table

Select the full table

✂ **SHORTCUT:** CTRL + Shift + &

Format currency

Select data

✂ **SHORTCUT** (Dollar)**:** CTRL + Shift + $

✂ **SHORTCUT** (Number)**:** CTRL + Shift + 1

CUSTOMERS	Quantity	Price	Revenue	Packages
Customer 1	200	$13.99	$2,798.00	100
Customer 2	260	$16.99	$4,417.40	130
Customer 3	320	$13.99	$4,476.80	160
Customer 4	380	$16.99	$6,456.20	190
Customer 5	440	$13.99	$6,155.60	220
Customer 6	500	$16.99	$8,495.00	250
Customer 7	560	$13.99	$7,834.40	280
Customer 8	399	$13.99	$5,582.01	200
Customer 9	299	$13.99	$4,183.01	150
Grand Total	3,358	$15.12	$50,398.42	1,679

CUSTOMERS	Quantity	Price		Revenue		Packages
Customer 1	200	$	13.99	$	2,798	100
Customer 2	260	$	16.99	$	4,417	130
Customer 3	320	$	13.99	$	4,477	160
Customer 4	380	$	16.99	$	6,456	190
Customer 5	440	$	13.99	$	6,156	220
Customer 6	500	$	16.99	$	8,495	250
Customer 7	560	$	13.99	$	7,834	280
Customer 8	399	$	13.99	$	5,582	200
Customer 9	299	$	13.99	$	4,183	150
Grand Total	3,358	$	15.12	$	50,398	1,679

Test Slicers on the Pivot Table, and see how the new table changes as well accordingly

CUSTOMERS ⊤	Quantity	Price	Revenue	Packages
Customer 3	320	$13.99	$4,476.80	160
Customer 4	380	$16.99	$6,456.20	190
Customer 5	440	$13.99	$6,155.60	220
Customer 7	560	$13.99	$7,834.40	280
Grand Total	**1,700**	**$14.74**	**$24,923.00**	**850**

CUSTOMERS	Quantity	Price		Revenue		Packages
Customer 3	320	$	13.99	$	4,477	160
Customer 4	380	$	16.99	$	6,456	190
Customer 5	440	$	13.99	$	6,156	220
Customer 7	560	$	13.99	$	7,834	280
Grand Total	1,700	$	14.74	$	24,923	850
	0	$	-	$	-	-
	0	$	-	$	-	-
	0	$	-	$	-	-
	0	$	-	$	-	-
	0	$	-	$	-	-

- Untick the slicers
- Select the first 3 columns of the second table – Normal Table (Customers, Quality, Price)
- Ribbon > Insert tab
- Click on the chart Icon

(creating charts from standard tables > select the data source manually and insert chart)
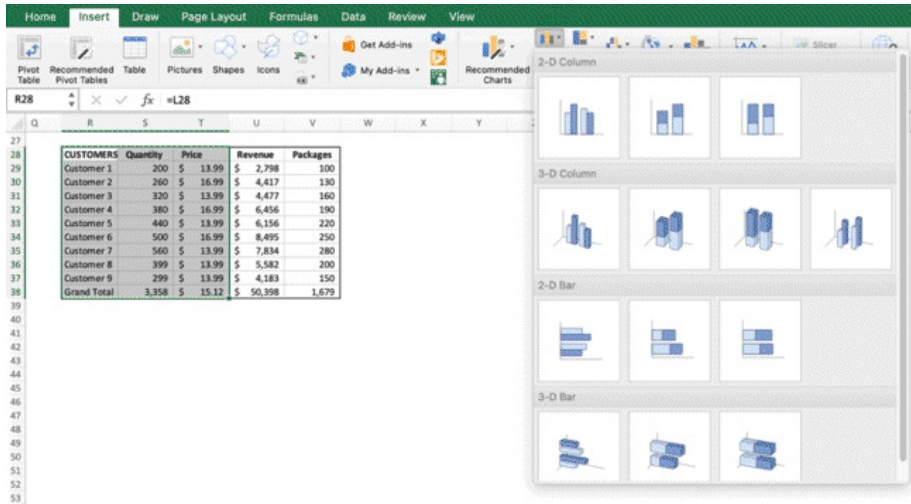
Difference between creating Standard Charts and creating Pivot Charts

PIVOT CHART: click anywhere in the Pivot Table.

A chart is created with ALL THE fields in the Pivot Table.

Formatting, adding and removing fields from the Pivot Table is time consuming

CHART: select the data you want and create a chart.

You can now work on a new standard table.

Insert the chart and start editing the series. This time, you can create one bar series and one line series.

Right click on the line > format data series > you will have different options such as Marker (you can see the marker selected in the line chart)

You can click on a data series in the chart and see what data is linked to

Click and hold the border of the selection box to drag them. Hold on the corners to change them.

You can drag the range once you Hover over one of the sides of the range

CUSTOMERS	Quantity	Price		Revenue		Packages
Customer 1	200	$	13	$	2,798	100
Customer 2	260	$	16.99	$	4,417	130
Customer 3	320	$	13.99	$	4,477	160
Customer 4	380	$	16.99	$	6,456	190
Customer 5	440	$	13.99	$	6,156	220
Customer 6	500	$	16.99	$	8,495	250
Customer 7	560	$	13.99	$	7,834	280
Customer 8	399	$	13.99	$	5,582	200
Customer 9	299	$	13.99	$	4,183	150
Grand Total	3,358	$	15.12	$	50,398	1,679

In case you notice something off on your chart, click on the data series one at a time and check what data they are connected to. Also, ensure you don't select the totals, or they will appear in the chart.

Check out how the chart changes as I drag the source of Revenue in the wrong place)

If you need to edit your chart, you can do it the following ways, same as for the Pivot Chart (with some differences)

- From the Ribbon > Chart Design > Format

- From the formatting panel on the right
  - ✎ **NOTE:** based on where you click in the chart, a different formatting panel will open to allow you the customisation on different items

- Right click on the legend, the axis, the labels
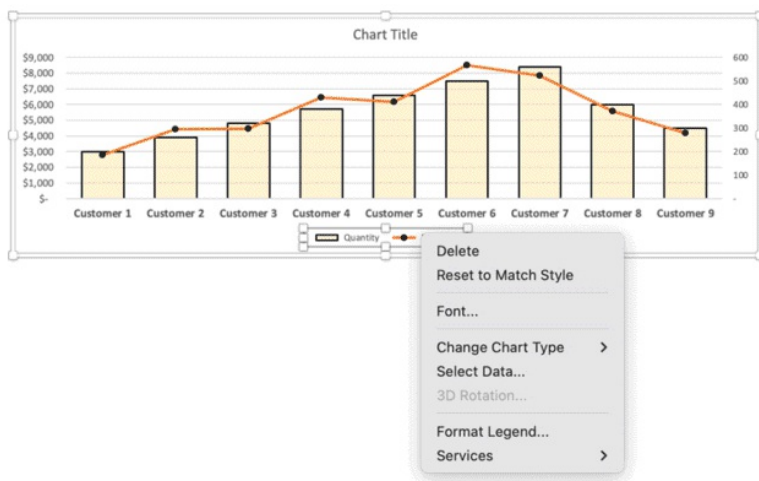
- Right click on gridlines

- Right click on a series
- Right click on the chart borders for other options

Let's recap what we learnt

1. Select data from a normal table
2. Insert chart
3. Customise series
4. Ways to customise series
5. Pros and Cons of Pivot Charts
6. How to create a table = to a Pivot Chart
7. How to flexibly change data

Change colors

This trick works for the color panel and will therefore work with charts, pivot charts, tables and

normal cells. Ribbon > Page Layout > Themes
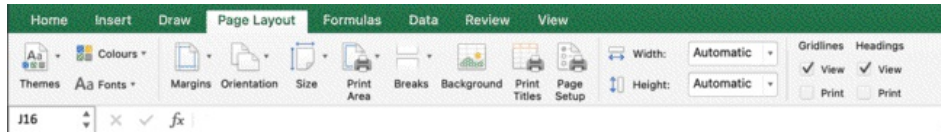
You can select one of the available themes
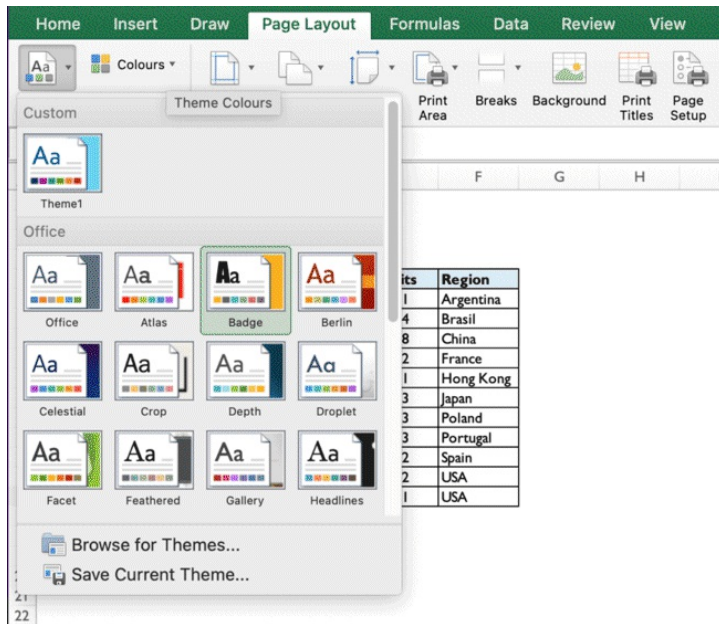
When you go back to the Home Tab in the ribbon and open the color panel, the colors have changed and you can now choose among better color combinations than the default one
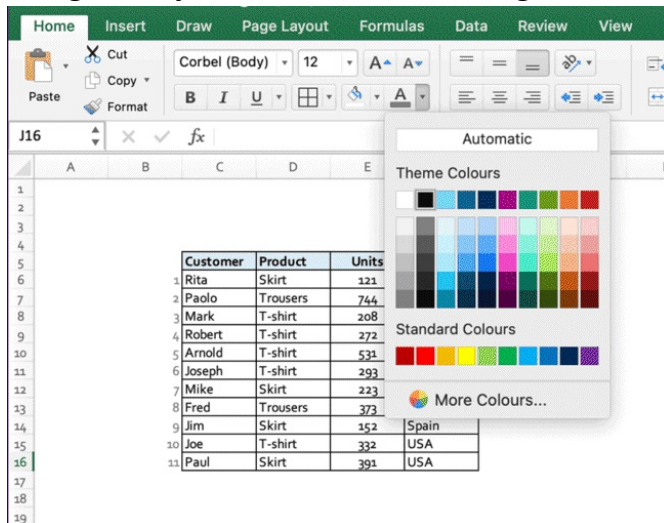
Once you create and customise all your tables and charts, changing the color template will automatically reflect on everything you created.

Pivot Charts and standard charts are almost identical. One of the main differences is that standard charts are linked directly to cells in the worksheet, while Pivot Charts are linked to a PivotTable data source. Unlike a standard chart, in Pivot Charts you cannot change the data range in the dialog box, so you can use the workarounds you just learnt to setup your tables in the smartest, leanest way possible.

Chapter 7: Data Cleaning

What is Data Cleaning and why it is important

So far, we have learnt a lot of the Excel fundamentals and laid down solid foundations to build up new knowledge and keep improving your skills.

1. We have learnt the basic ways to navigate a Worksheet
2. We built a simple table
3. We created Pivot Tables
4. We created Pivot Charts
5. We created a simple interactive dashboard
6. We learnt how to customise colors and design for charts and tables
7. We learnt how to format cells based on conditions

Now we will take a step back, and instead of building a simple table like in point 2, we will start from a large data set and simulate a real work scenario, where we receive a data set, we navigate through it and we notice that we have to clean the data. Only afterwards we can start analysing it and apply the techniques we learnt.

The data cleaning process includes a set of actions you need to perform on raw data before you are able to start analysing it through tables and charts.

Why do the data need to be cleaned? There are many reasons behind it, but the main explanation is that data cleaning is related to the data collection process. Depending on how the data has been collected by the person or the machine giving you the data set, you will have to apply a set of technique to harmonize the dataset and get it ready. Excel has 5 main ways to help you do that

Excel data cleaning processes
1. Text to column
2. Flash Fill
3. Formulas
4. Remove Duplicates
5. Power Query

Text to Column

Text to column is one of the most important commands when it comes to data cleaning. It works when you have a scenario like the below, where all the elements in a column have a structure where they are separated by the same **separator**. This examples often comes up in **online advertising**, where your campaign, ad set and ads may include a lot of information, separated by a hyphen (-) or an underscore (_) or similar. Let's see a simple example with Customer Name. As you can see, we are receiving all the names in the format Name_Surname, and we want to split them in 2 separate columns.

CUSTOMERS	Quantity	Price		Revenue		Packages	Customer Name
Customer 1	200	$	13.99	$	2,798	100	Mark_Smith
Customer 2	260	$	16.99	$	4,417	130	Paul_Irons
Customer 3	320	$	13.99	$	4,477	160	Robert_Cole
Customer 4	380	$	16.99	$	6,456	190	Manuel_Reed
Customer 5	440	$	13.99	$	6,156	220	Francis_Mark
Customer 6	500	$	16.99	$	8,495	250	Mary_Zanetti
Customer 7	560	$	13.99	$	7,834	280	Robert_Sheen
Customer 8	399	$	13.99	$	5,582	200	Marius_Poirier
Customer 9	299	$	13.99	$	4,183	150	Justin_Oliver
Grand Total	3,358	$	15.12	$	50,398	1,679	

All you have to do is
- select the column
- from the Ribbon click Data > Text to column
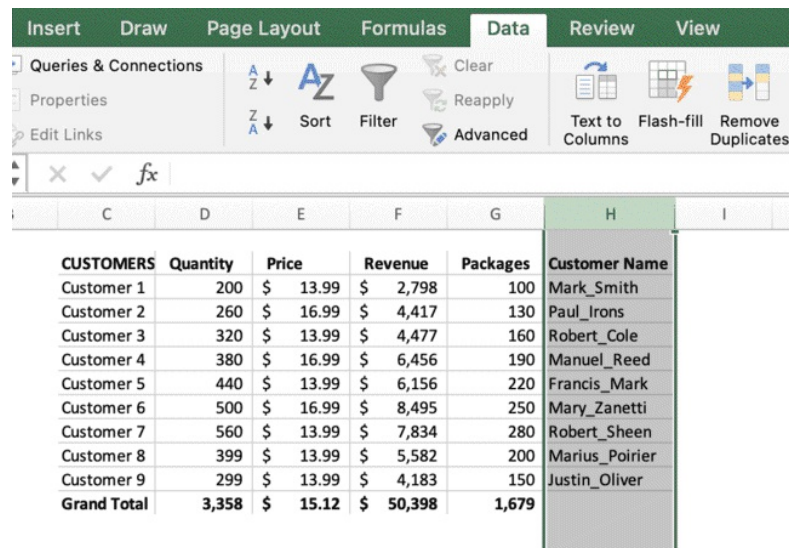
- Select the **separator** > press Enter

The separator is that repeated element in your name that you want to use as "split point".

Your name will be split and new columns will be created (n= number of separators in the name -1).

Understanding this concept also allows you to understand how to structure your data during the collection process. Ensuring you plan ahead and decide an effective naming convention, will allow you to clean your data faster and get better insights in less time.

As mentioned, an example when Text to Column is required can be an Online Advertising Campaign. The name of your adverts could follow the following naming convention:

Campaign Name_Campaign Goal_Country_Age_Gender_Targeting_Creative_Ad Copy

Black Friday_Traffic_USA_18-44_M + F_Baby Boomers_Smiling Woman_Copy 3

So. when you export your data, a simple text to column will create 9 different columns, which will give you 9 new dimensions and table filters instantly.
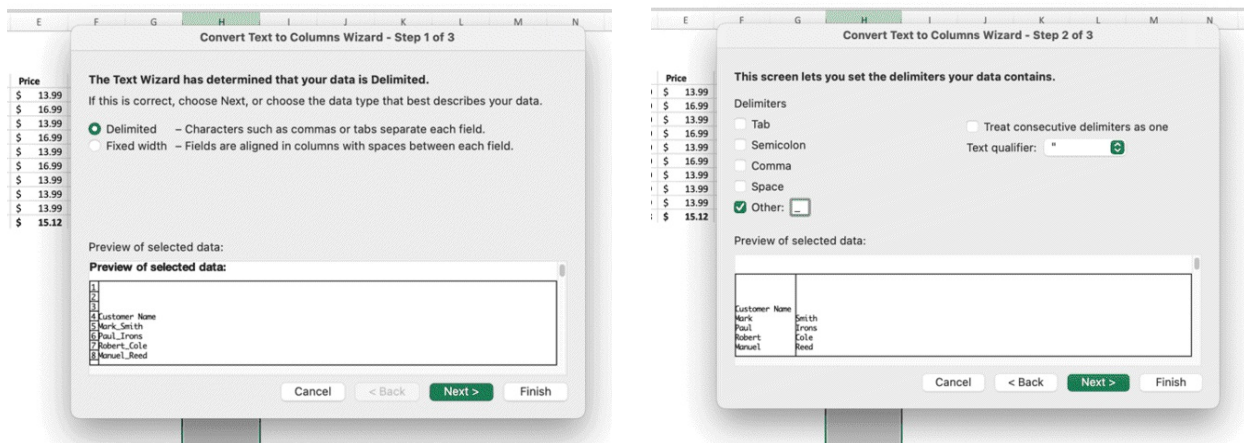
- as new columns will be created on the right, ensure you don't have data within the column on the right create enough space adding new empty columns (using the shortcuts you learnt in the previous chapters) so you will avoid data overwriting.

  Add Row(s) – Select Row(s) in the middle of the data set

  ✂ **SHORTCUT:** CTRL + SHIFT + +

CUSTOMERS	Quantity	Price		Revenue		Packages	Customer Name	
Customer 1	200	$	13.99	$	2,798	100	Mark	Smith
Customer 2	260	$	16.99	$	4,417	130	Paul	Irons
Customer 3	320	$	13.99	$	4,477	160	Robert	Cole
Customer 4	380	$	16.99	$	6,456	190	Manuel	Reed
Customer 5	440	$	13.99	$	6,156	220	Francis	Mark
Customer 6	500	$	16.99	$	8,495	250	Mary	Zanetti
Customer 7	560	$	13.99	$	7,834	280	Robert	Sheen
Customer 8	399	$	13.99	$	5,582	200	Marius	Poirier
Customer 9	299	$	13.99	$	4,183	150	Justin	Oliver
Grand Total	3,358	$	15.12	$	50,398	1,679		

- Swipe through the new data to ensure everything is in place and manually adjust any potential error derived by inconsistency when naming the items.

- Now you can:
  - Quickly format as a table ✂ **SHORTCUT:** CTRL + T
  - Click on Filters. You have just created a new dimension to analyse the data

CUSTOMERS	Quantity	Price		Revenue	Packages	Name	Surname
Customer 1	200	$	13.99	$ 2,798	100	Mark	Smith
Customer 2		$	16.99	$ 4,417	130	Paul	Irons
Customer 3	320	$	13.99	$ 4,477	160	Robert	Cole
Customer 4		$	16.99	$ 6,456	190	Manuel	Reed
Customer 6	500	$	16.99	$ 8,495	250	Mary	Zanetti
Customer 8		$	13.99	$ 5,582	200	Marius	Poirier
Customer 9	299	$	13.99	$ 4,183	150	Justin	Oliver
Grand Total	**3,358**	**$**	**15.12**	**$ 50,398**	**1,679**		
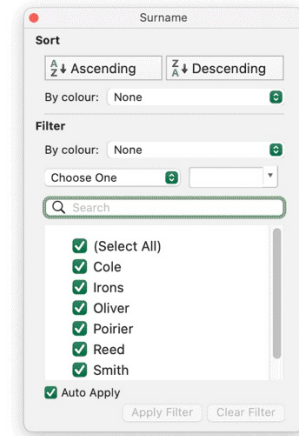
- You can split the columns by fixed width as well, this would work well for instance if you had a column with cars' licence plates. In this instance, it would be difficult for you to find a separator that all the cells in the column share, but you can easily split the columns by fixed width (e.g., separate the first 2 numbers from the rest of the values in the string)
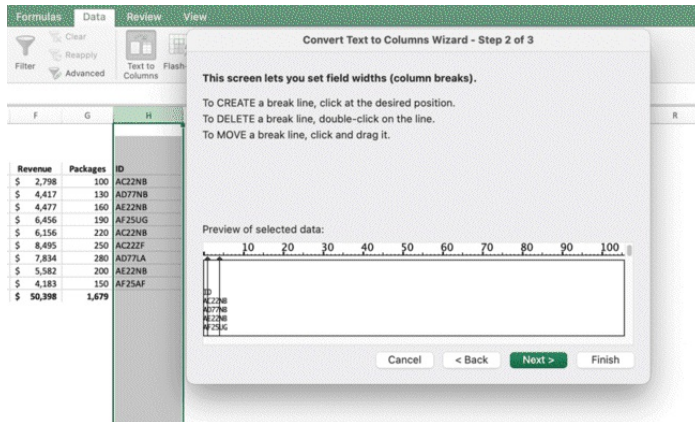
And get to a final result, as follows

CUSTOMERS	Quantity	Price		Revenue		Packages	I	D		
Customer 1	200	$	13.99	$	2,798	100	A	C22		NB
Customer 2	260	$	16.99	$	4,417	130	A	D77		NB
Customer 3	320	$	13.99	$	4,477	160	A	E22		NB
Customer 4	380	$	16.99	$	6,456	190	A	F25		UG
Customer 5	440	$	13.99	$	6,156	220	A	C22		NB
Customer 6	500	$	16.99	$	8,495	250	A	C22		ZF
Customer 7	560	$	13.99	$	7,834	280	A	D77		LA
Customer 8	399	$	13.99	$	5,582	200	A	E22		NB
Customer 9	299	$	13.99	$	4,183	150	A	F25		AF
Grand Total	3,358	$	15.12	$	50,398	1,679				

You will have to manually input the column headers, unless you can successfully apply text to column to the header as well.

Flash Fill

Flash fill is a powerful Excel command that you can use when you want to automatically complete a sequence and fill the cells below with one click.

It corresponds to the "Drag cell" we have analysed earlier or to the **"double click on the cell anchor point"** to complete a sequence following a pattern.

Let's suppose you have a list of people with name and surname.

Go the first empty cell on the right and start inputting the first name in the first cell.

Excel will recognize the pattern and will give you the opportunity to flash fill by pressing enter

- Press Enter to accept flash fill
- ✂ **SHORTCUT:** Press CTLR + E to flash fill

CUSTOMERS	Quantity	Price		Revenue		Packages	Customer Name	Name
Customer 1	200	$	13.99	$	2,798	100	Mark_Smith	Mark
Customer 2	260	$	16.99	$	4,417	130	Paul_Irons	
Customer 3	320	$	13.99	$	4,477	160	Robert_Cole	
Customer 4	380	$	16.99	$	6,456	190	Manuel_Reed	
Customer 5	440	$	13.99	$	6,156	220	Francis_Mark	
Customer 6	500	$	16.99	$	8,495	250	Mary_Zanetti	
Customer 7	560	$	13.99	$	7,834	280	Robert_Sheen	
Customer 8	399	$	13.99	$	5,582	200	Marius_Poirier	
Customer 9	299	$	13.99	$	4,183	150	Justin_Oliver	
Grand Total	3,358	$	15.12	$	50,398	1,679		

Flashfill
CTRL + E

Excel recognizes the pattern will apply flash-fill on the entire column, up to the bottom of the table.

CUSTOMERS	Quantity	Price		Revenue		Packages	Customer Name	Name
Customer 1	200	$	13.99	$	2,798	100	Mark_Smith	Mark
Customer 2	260	$	16.99	$	4,417	130	Paul_Irons	Paul
Customer 3	320	$	13.99	$	4,477	160	Robert_Cole	Robert
Customer 4	380	$	16.99	$	6,456	190	Manuel_Reed	Manuel
Customer 5	440	$	13.99	$	6,156	220	Francis_Mark	Francis
Customer 6	500	$	16.99	$	8,495	250	Mary_Zanetti	Mary
Customer 7	560	$	13.99	$	7,834	280	Robert_Sheen	Robert
Customer 8	399	$	13.99	$	5,582	200	Marius_Poirier	Marius
Customer 9	299	$	13.99	$	4,183	150	Justin_Oliver	Justin
Grand Total	3,358	$	15.12	$	50,398	1,679		

Flashfill
CTRL + E

Flash fill is a static option. It means that if the original cells changes, the flash filled cells will not.

You will have to manually update them and repeat flash fill. We will discover later **how to fill cells dynamically through formulas.**

Remove Duplicates

The remove duplicates function allows you to remove identical rows and avoid issues related to multiple record entry with the same values. So, you avoid counting the same data twice.

The duplicate rows that share 6 values are highlighted in grey.

CUSTOMERS	Quantity	Price		Revenue	Packages	Customer Name
Customer 1	200	$	13.99	$ 2,798	100	Mark_Smith
Customer 2	260	$	16.99	$ 4,417	130	Paul_Irons
Customer 3	320	$	13.99	$ 4,477	160	Robert_Cole
Customer 4	380	$	16.99	$ 6,456	190	Manuel_Reed
Customer 1	200	$	13.99	$ 2,798	100	Mark_Smith
Customer 6	500	$	16.99	$ 8,495	250	Mary_Zanetti
Customer 1	200	$	13.99	$ 2,798	100	Mark_Smith
Customer 8	399	$	13.99	$ 5,582	200	Marius_Poirier
Customer 9	299	$	13.99	$ 4,183	150	Justin_Oliver
Grand Total	3,358	$	15.12	$ 50,398	1,679	

Just select the data set, then click on

- From the Ribbon > Data > Remove duplicates

- You can select which values (by columns) will have to be identical between 2 rows so one of the rows can be deleted as it will be considered as duplicate
- Press Ok
- A popup message will tell you how many rows have been removed from the original data set

CUSTOMERS	Quantity	Price	Revenue	Packages	Customer Name
Customer 1	200	$ 13.99	$ 2,798	100	Mark_Smith
Customer 2	260	$ 16.99	$ 4,417	130	Paul_Irons
Customer 3	320	$ 13.99	$ 4,477	160	Robert_Cole
Customer 4	380	$ 16.99	$ 6,456	190	Manuel_Reed
Customer 6	500	$ 16.99	$ 8,495	250	Mary_Zanetti
Customer 8	399	$ 13.99	$ 5,582	200	Marius_Poirier
Customer 9	299	$ 13.99	$ 4,183	150	Justin_Oliver
Grand Total	3,358	$ 15.12	$ 50,398	1,679	

Alert

2 duplicate values found and removed; 8 unique values remain.

OK

✏ **NOTE:** those processes are all manual and they need to be re-done every time you have a new data set, unless you want to automate them with Macros (VBA) or Power Query. Another level of automation can be achieved through formulas. Let's have a look at some formulas and shortcuts you can use to quickly clean your data.

Remove Empty Values

It may happen that some cells in your file have empty values, so you want to identify them fast and decide what to do with them. You can hide them, remove them or replace the missing values manually.

There are many ways to do it and we will see a few.

	A	B	C		D	E	F	G	H
1	CUSTOMERS	Quantity	Price		Revenue	Packages	Name	Surname	
2	Customer 1	200	$	13.99	$ 2,798	100	Mark	Smith	
3	Customer 2		$	16.99	$ 4,417	130	Paul	Irons	
4	Customer 3	320	$	13.99	$ 4,477	160	Robert	Cole	
5	Customer 4		$	16.99	$ 6,456	190	Manuel	Reed	
6	Customer 6	500	$	16.99	$ 8,495	250	Mary	Zanetti	
7	Customer 8		$	13.99	$ 5,582	200	Marius	Poirier	
8	Customer 9	299	$	13.99	$ 4,183	150	Justin	Oliver	
9	Customer 1	425	$	14.85	$ 6,702	222	Mark	Smith	
10	Customer 2	449	$	14.74	$ 7,077	236	Paul	Irons	
11	Customer 3	473	$	14.63	$ 7,452	249	Robert	Cole	
12	Customer 4	497	$	14.53	$ 7,827	263	Manuel	Reed	
13	Customer 6	521	$	14.42	$ 8,202	276	Mary	Zanetti	
14	Customer 8	544	$	14.31	$ 8,577	290	Marius	Poirier	
15	Customer 9	568	$	14.20	$ 8,952	303	Justin	Oliver	
16	Customer 1	592	$	14.10	$ 9,327	317	Mark	Smith	
17	Customer 2	616	$	13.99	$ 9,702	330	Paul	Irons	
18	Customer 3	640	$	13.88	$ 10,077	344	Robert	Cole	
19	Customer 4		$	13.78	$ 10,452	357	Manuel	Reed	
20	Customer 6		$	13.67	$ 10,828	371	Mary	Zanetti	
21	Customer 8	711	$	13.56	$ 11,203	384	Marius	Poirier	
22	Customer 9	735	$	13.45	$ 11,578	398	Justin	Oliver	
23	Customer 1	759	$	13.35	$ 11,953	411	Mark	Smith	
24	Customer 2		$	13.24	$ 12,328	425	Paul	Irons	
25	Customer 3	807	$	13.13	$ 12,703	438	Robert	Cole	
26	Customer 4	831	$	13.03	$ 13,078	452	Manuel	Reed	
27	Customer 6		$	12.92	$ 13,453	465	Mary	Zanetti	
28	Customer 8	878	$	12.81	$ 13,828	479	Marius	Poirier	
29	Customer 9	902	$	12.70	$ 14,203	492	Justin	Oliver	
30									

Technique 1

- ✂ **SHORTCUT:** Click CTRL + SHIFT + L to add filters
- Click on Quantity > Filter Icon
- Untick **(Blanks)** from the list
- You will notice changes in the row numbers, as these rows are now hidden
- You can repeat this process for any column you need to quickly see through your data set, both with one or multiple filters selected at a time

Technique 2

- ✂ **SHORTCUT:** Click CTRL + SHIFT + L to add filters
- Filter by Descending Order to group the empty values at the bottom of the data set

Technique 3

- ✂ **SHORTCUT:** Click CTRL + G to open **Go to** Panel > Click on Special
- ⏱ **MANUAL:** Ribbon > Home > Find & Select > Go to Special > select Blanks

All the blank cells are automatically selected. You can change the color to highlight them and sort them by color, to add a visual element to the data set.
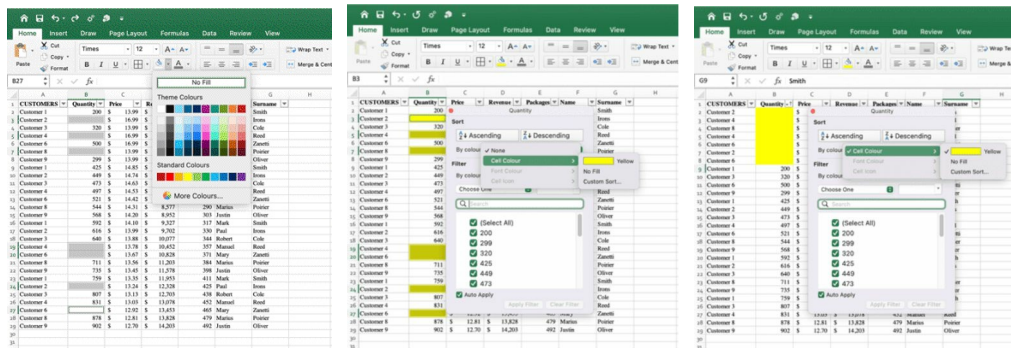
Once you identify the blank cells in your data set, you can decide how to manage them. You can remove the entire rows, hide them or manually fill in the blanks.

Power Query

Power Query offers is an Excel automation tool to connect external databases, extract data and process it. The result is an Excel table with the extracted data, which can be updated with a click. With Power Query you can connect different data sources in the cloud in a unique worksheet, you can extract, model, clean and analyse data and create automations. Power Query involves some programming understanding and it's generally time consuming. It's an advanced tool that will be explained in a dedicated book.

Excel formulas for professionals

We will now have a look at some new formulas you can use to clean your data. The advantage of the **formulas** is that they **are dynamic**, therefore, if some cells change in the original data, the results displayed in the formulas will change accordingly. Those formulas can be used to clean the data and to carry out other tasks.

If Formula

The IF formula is one of the most important formulas in Excel, particularly useful when used on large data sets. If a specific condition you set is verified in a cell, the destination cell will display a value you decide. Let's look at an example.

We are running 5 advertising campaigns in 5 different countries. We have a specific budget for each country and we have updated the spend data so we can now verify how we are pacing.

Campaign	Budget	Spend
USA	$ 31,738	$ 17,837
France	$ 18,937	$ 19,283
Italy	$ 12,492	$ 15,829
Spain	$ 12,746	$ 11,829
Japan	$ 14,673	$ 13,928

We are now going to add a column with the formula. We will use the IF formula to compare spend data with budget data and return information automatically based on the calculation.

We can type in E4 **=IF(D4>C4,"Over Budget","OK")**

If the value in D4 is greater than the value in C4 (and so the condition is met), the formula will return the first parameter, "Over Budget", otherwise the formula will return the second parameter: "OK".

You can change the values in cell A2 or B2 to see how the value in C2 will change accordingly. You can write any condition you want in the first part of the formula, as long as it is a correct formula, and decide what values to display if the condition is met or not. You can also write more complex formulas in the first part and include more than 2 cells. If needed, you can then flash-fill and create a new column in the table that will automatically update as the cells involved in the formula will change values.

You have now the basics of this formula. We will not analyse all the possible scenarios where you can use it (or this book would become 2,000 pages), but you have now enough knowledge to know that IF formula is used to compare values and cells through formulas and return a specific output whether the condition is verified or not.
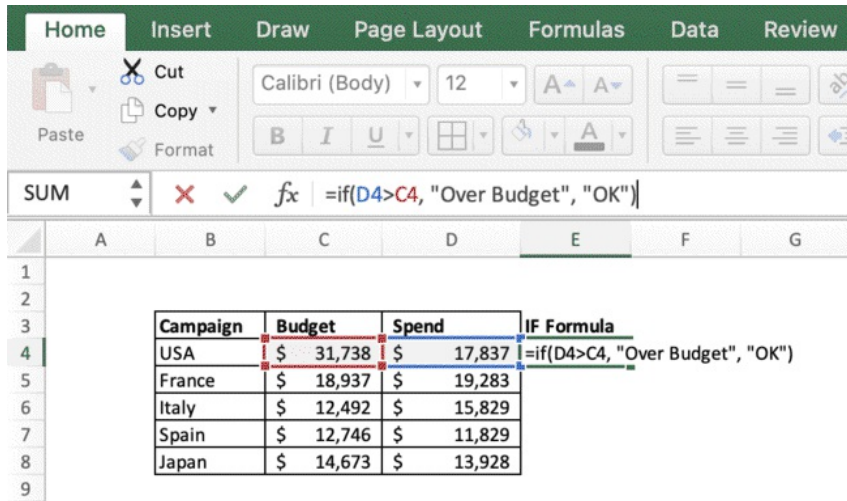
Press Enter and drag the formula down

Campaign	Budget	Spend	IF Formula
USA	$ 31,738	$ 17,837	OK
France	$ 18,937	$ 19,283	Over Budget
Italy	$ 12,492	$ 15,829	Over Budget
Spain	$ 12,746	$ 11,829	OK
Japan	$ 14,673	$ 13,928	OK

If we realize we made a mistake and we need to correct one parameter (e.g. Japan budget), we just need to edit the cell and the IF formula will update automatically.

Campaign	Budget	Spend	IF Formula
USA	$ 31,738	$ 17,837	OK
France	$ 18,937	$ 19,283	Over Budget
Italy	$ 12,492	$ 15,829	Over Budget
Spain	$ 12,746	$ 11,829	OK
Japan	$ 13,673	$ 13,928	Over Budget

We can also combine this formula with Conditional Formatting to have instant visual insights as we update the data.

Ribbon > Home > Conditional Formatting > Highlight Cell Rules > Text that contains > type "Over"

All the significant changes in Budget and Spend will reflect on the new column and the formatting.
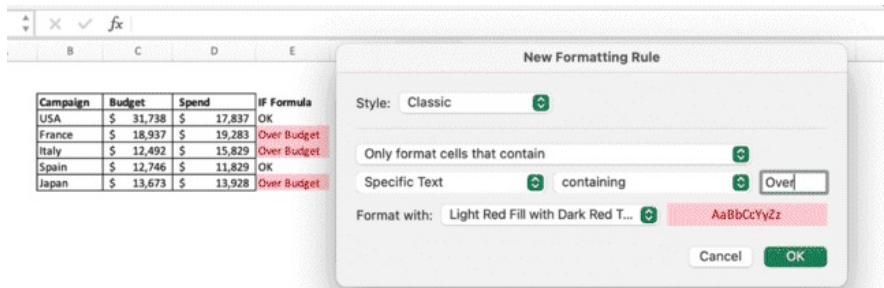
Mastering formulas and combining them with formatting is one of the most important skills you can invest in, as it will allow you to work faster, smarter and more flexibly. Once you will be able to leverage Excel automation, you will be able to get Excel doing most of the heavy-lifting for you.

That's personally one of the things I like the most: coming up with the fastest processes to make every week's work faster. And, I can tell you, I can go much faster than many. It all comes down to planning, organization, understanding which tasks you will have to repeat every week, and then find a way to automate them as much as possible.

Trim

The trim formula allows you to remove un-necessary spaces from a text string. For instance: in this example the column with the customers names has a lot of spaces and we need to clean it.

- Select an empty cell near customers names and write = Trim(
- Select the cell you want to remove the spaces from and close the bracket
- Press Enter
- Drag down the formula

CUSTOMERS	Customer Name	TRIM
Customer 1	Mark Smith	Mark Smith
Customer 2	Paul Irons	Paul Irons
Customer 3	Robert Cole	Robert Cole
Customer 4	Manuel Reed	Manuel Reed
Customer 6	Mary Zanetti	Mary Zanetti
Customer 8	Marius Poirier	Marius Poirier
Customer 9	Justin Oliver	Justin Oliver

You can also use the formulas

Left, Mid, Right

Let's add a new field to our data set: Customer ID

- Select the cell you want to extract the characters from
- =Left(cell, number of characters from the left you want to extract)
- =Mid(cell, starting letter number, number of characters from you want to extract)
- =Right(cell, number of characters from the right you want to extract)

Again, **formulas are dynamic**, so you can automatically manage any data changes dynamically and use these formulas to remove unnecessary spaces.

Left

Type =Left(select cell, type the number of char from the left you want to extract)

Right

Type =Right(select cell, type the number of char from the right you want to extract)

Mid

Type =Mid(select cell, type the cell index where to start from**(5)**, type the number of char to extract**(3)**)

CUSTOMERS	Customer Name	TRIM	Customer ID	LEFT	RIGHT	MID
Customer 1	Mark Smith	Mark Smith	123-000-134	123	34	=MID(F35, 5, 3)
Customer 2	Paul Irons	Paul Irons	134-291-203	134	03	
Customer 3	Robert Cole	Robert Cole	282-203-203	282	03	
Customer 4	Manuel Reed	Manuel Reed	192-293-771	192	71	
Customer 6	Mary Zanetti	Mary Zanetti	928-394-293	928	93	
Customer 8	Marius Poirier	Marius Poirier	442-332-110	442	10	
Customer 9	Justin Oliver	Justin Oliver	920-102-234	920	34	

CUSTOMERS	Customer Name	TRIM	Customer ID	LEFT	RIGHT	MID
Customer 1	Mark Smith	Mark Smith	123-000-134	123	34	000
Customer 2	Paul Irons	Paul Irons	134-291-203	134	03	291
Customer 3	Robert Cole	Robert Cole	282-203-203	282	03	203
Customer 4	Manuel Reed	Manuel Reed	192-293-771	192	71	293
Customer 6	Mary Zanetti	Mary Zanetti	928-394-293	928	93	394
Customer 8	Marius Poirier	Marius Poirier	442-332-110	442	10	332
Customer 9	Justin Oliver	Justin Oliver	920-102-234	920	34	102

Upper, Proper, Lower

Upper, Proper and Lower are easy formulas to automate data cleaning and fix text lettering issues.

The syntax is very simple

- *=LOWER(text)*
- *=UPPER(text)*
- *=PROPER(text)*

Let's see an example. Let's imagine that the previous table where we trimmed the customer name comes in a bit different. Not only there is a lot of un-necessary spacing in the names, but also the capitalisation is not correct. There is a mix of randomly capitalised and uncapitalised letters and we want to be able to clean the data properly, fast, and flexibly. Most of all, automatically.

As you can see, I edited the Customer Name column and the TRIM formulas got updated, by removing the un-necessary spaces but leaving us with some formatting issues

CUSTOMERS	Customer Name	TRIM
Customer 1	MARK smith	MARK smith
Customer 2	PAuL irOns	PAuL irOns
Customer 3	RoBeRt coLe	RoBeRt coLe
Customer 4	ManuEL REed	ManuEL REed
Customer 6	Mary ZAneTTi	Mary ZAneTTi
Customer 8	MARius poRlier	MARius poRlier
Customer 9	JuSTin OlivER	JuSTin OlivER

Upper (all letters are capitalised)

Type =UPPER(select the cell you want to format)

CUSTOMERS	Customer Name	TRIM	UPPER
Customer 1	MARK smith	MARK smith	=UPPER(E47
Customer 2	PAuL irOns	PAuL irOns	UPPER(text)
Customer 3	RoBeRt coLe	RoBeRt coLe	
Customer 4	ManuEL REed	ManuEL REed	
Customer 6	Mary ZAneTTi	Mary ZAneTTi	
Customer 8	MARius poRlier	MARius poRlier	
Customer 9	JuSTin OlivER	JuSTin OlivER	

CUSTOMERS	Customer Name	TRIM	UPPER
Customer 1	MARK smith	MARK smith	MARK SMITH
Customer 2	PAuL irOns	PAuL irOns	PAUL IRONS
Customer 3	RoBeRt coLe	RoBeRt coLe	ROBERT COLE
Customer 4	ManuEL REed	ManuEL REed	MANUEL REED
Customer 6	Mary ZAneTTi	Mary ZAneTTi	MARY ZANETTI
Customer 8	MARius poRlier	MARius poRlier	MARIUS PORIIER
Customer 9	JuSTin OlivER	JuSTin OlivER	JUSTIN OLIVER

Lower (all letters are uncapitalised)

Type =LOWER(select the cell you want to format)

CUSTOMERS	Customer Name	TRIM	UPPER	
Customer 1	MARK smith	MARK smith	MARK SMITH	=lower(E47
Customer 2	PAuL irOns	PAuL irOns	PAUL IRONS	LOWER(text)
Customer 3	RoBeRt coLe	RoBeRt coLe	ROBERT COLE	
Customer 4	ManuEL REed	ManuEL REed	MANUEL REED	
Customer 6	Mary ZAneTTi	Mary ZAneTTi	MARY ZANETTI	
Customer 8	MARius poRlier	MARius poRlier	MARIUS PORIIER	
Customer 9	JuSTin OlivER	JuSTin OlivER	JUSTIN OLIVER	

CUSTOMERS	Customer Name	TRIM	UPPER	lower
Customer 1	MARK smith	MARK smith	MARK SMITH	mark smith
Customer 2	PAuL irOns	PAuL irOns	PAUL IRONS	paul irons
Customer 3	RoBeRt coLe	RoBeRt coLe	ROBERT COLE	robert cole
Customer 4	ManuEL REed	ManuEL REed	MANUEL REED	manuel reed
Customer 6	Mary ZAneTTi	Mary ZAneTTi	MARY ZANETTI	mary zanetti
Customer 8	MARius poRlier	MARius poRlier	MARIUS PORIIER	marius poriier
Customer 9	JuSTin OlivER	JuSTin OlivER	JUSTIN OLIVER	justin oliver

Proper (only initials are capitalised)

Type =PROPER(select the cell you want to format)

CUSTOMERS	Customer Name	TRIM	UPPER	lower	
Customer 1	MARK smith	MARK smith	MARK SMITH	mark smith	=Proper(E47
Customer 2	PAuL irOns	PAuL irOns	PAUL IRONS	paul irons	PROPER(text)
Customer 3	RoBeRt coLe	RoBeRt coLe	ROBERT COLE	robert cole	
Customer 4	ManuEL REed	ManuEL REed	MANUEL REED	manuel reed	
Customer 6	Mary ZAneTTi	Mary ZAneTTi	MARY ZANETTI	mary zanetti	
Customer 8	MARius poRlier	MARius poRlier	MARIUS PORIIER	marius poriier	
Customer 9	JuSTin OlivER	JuSTin OlivER	JUSTIN OLIVER	justin oliver	

Proper is the best option in our case. It doesn't matter how I will receive the data in the customer name column, as long as I have trim and proper combined, I will be able to manage those types of issues automatically and transform the data exactly as I want in auto-pilot

CUSTOMERS	Customer Name	TRIM	UPPER	lower	Proper
Customer 1	MARK smith	MARK smith	MARK SMITH	mark smith	Mark Smith
Customer 2	PAuL irOns	PAuL irOns	PAUL IRONS	paul irons	Paul Irons
Customer 3	RoBeRt coLe	RoBeRt coLe	ROBERT COLE	robert cole	Robert Cole
Customer 4	ManuEL REed	ManuEL REed	MANUEL REED	manuel reed	Manuel Reed
Customer 6	Mary ZAneTTi	Mary ZAneTTi	MARY ZANETTI	mary zanetti	Mary Zanetti
Customer 8	MARius poRlier	MARius poRlier	MARIUS PORIIER	marius poriier	Marius Poriier
Customer 9	JuSTin OlivER	JuSTin OlivER	JUSTIN OLIVER	justin oliver	Justin Oliver

These functions can also be combined in the same formula, to save space and time. Combining formulas is a very common activity in Excel, it requires a deeper understanding of Excel and formulas.

But, as said, **master the simple things and you will be able to create great automations**. Below is an example of how formulas can generally be combined.

In this example, if I know that my data will have those types of formatting issues, I can easily create a formula with two nested functions to clean it automatically.

CUSTOMERS	Customer Name	
Customer 1	MARK smith	=PROPER(TRIM(D57))
Customer 2	PAuL irOns	
Customer 3	RoBeRt coLe	
Customer 4	ManuEL REed	
Customer 6	Mary ZAneTTi	
Customer 8	MARius poRlier	
Customer 9	JuSTin OlivER	

CUSTOMERS	Customer Name	Trim & Proper
Customer 1	MARK smith	Mark Smith
Customer 2	PAuL irOns	Paul Irons
Customer 3	RoBeRt coLe	Robert Cole
Customer 4	ManuEL REed	Manuel Reed
Customer 6	Mary ZAneTTi	Mary Zanetti
Customer 8	MARius poRlier	Marius Poriier
Customer 9	JuSTin OlivER	Justin Oliver

Concatenate

Now, let's complicate the scenario a bit more and introduce some advanced tips.

Our focus will be the Customer Name Column. Let's imagine that the people or the software that collects and organize the data is struggling to send us a clean spreadsheet.

So, not only there are spacing and lettering issues, but names and surnames are in separate columns.

CUSTOMERS	Name	Surname
Customer 1	MARK	smith
Customer 2	PAuL	irOns
Customer 3	RoBeRt	coLe
Customer 4	ManuEL	REed
Customer 6	Mary	ZAneTTi
Customer 8	MARius	poRlier
Customer 9	JuSTin	OlivER

You can use the function Concat to dynamically link the values from two different cells

Syntax =concat(text1, text2,…)

CUSTOMERS	Name	Surname	
Customer 1	MARK	smith	=concat(D68,E68
Customer 2	PAuL	irOns	CONCAT(text1, [text2], …)
Customer 3	RoBeRt	coLe	
Customer 4	ManuEL	REed	
Customer 6	Mary	ZAneTTi	
Customer 8	MARius	poRlier	
Customer 9	JuSTin	OlivER	

CUSTOMERS	Name	Surname	Concat
Customer 1	MARK	smith	MARK smith
Customer 2	PAuL	irOns	PAuL irOns
Customer 3	RoBeRt	coLe	RoBeRt coLe
Customer 4	ManuEL	REed	ManuEL REed
Customer 6	Mary	ZAneTTi	Mary ZAneTTi
Customer 8	MARius	poRlier	MARius poRlier
Customer 9	JuSTin	OlivER	JuSTin OlivER

No matter how Name and Surname will change, the function Concat will combine them for me.

All you need to do now, is to apply the nested proper and trim functions to the concatenated cells

CUSTOMERS	Name	Surname	Concat	
Customer 1	MARK	smith	MARK smith	=PROPER(TRIM(F68))
Customer 2	PAuL	irOns	PAuL irOns	
Customer 3	RoBeRt	coLe	RoBeRt coLe	
Customer 4	ManuEL	REed	ManuEL REed	
Customer 6	Mary	ZAneTTi	Mary ZAneTTi	
Customer 8	MARius	poRlier	MARius poRlier	
Customer 9	JuSTin	OlivER	JuSTin OlivER	

CUSTOMERS	Name	Surname	Concat	Customer Name
Customer 1	MARK	smith	MARK smith	Mark Smith
Customer 2	PAuL	irOns	PAuL irOns	Paul Irons
Customer 3	RoBeRt	coLe	RoBeRt coLe	Robert Cole
Customer 4	ManuEL	REed	ManuEL REed	Manuel Reed
Customer 6	Mary	ZAneTTi	Mary ZAneTTi	Mary Zanetti
Customer 8	MARius	poRlier	MARius poRlier	Marius Poriier
Customer 9	JuSTin	OlivER	JuSTin OlivER	Justin Oliver

I know what you are thinking.

Can I combine these functions in the same formula?

The answer is Yes. As you can see, below we combined all the 3 functions. We can use this automation to clean our data and set this up to automatically clean the data every week, when we receive updates.

To stress a bit more on the importance of automations, bear in mind that you are not learning these skills to use them on a dataset only once. As you will be working on a specific process, you will more likely work on different data sources and you will receive updates on a weekly, daily or hourly basis. This will require you to get familiar with the data source, set-up a cleaning process / routine, setup tables and charts, and set-yourself up to spend the least amount of time doing manually things that you can automate. This will require you to learn the process, and find the best solution to make your life easier.

The order of the function is very important and it's not uncommon to encounter errors when trying to combine multiple functions or operators in the same formula. This is part of the process and will require you to check brackets, columns, semi-columns and syntax.
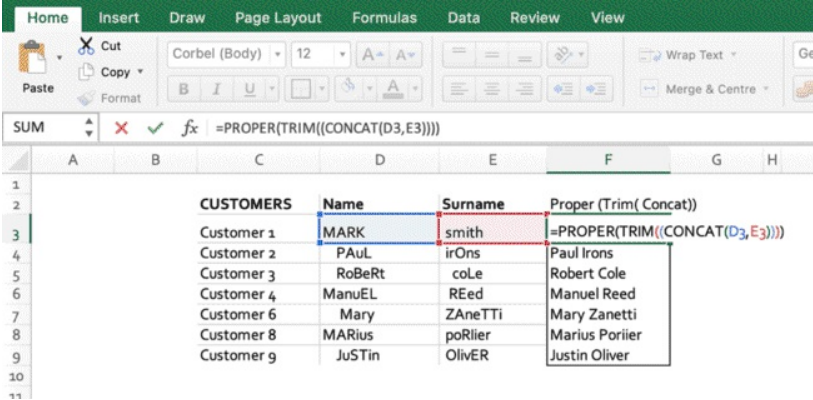
Chapter 8: Excel Most Important Formulas & Functions

There are over 470 formulas in Excel Function Library.

As we have seen, formulas allow you to compute quick calculations, setup validation conditions, automate the work, clean data and much more. We will now go through the most important Excel formulas you need to know to consider yourself proficient in Excel.

These formulas will allow you to dramatically improve your skills, improve your chances of landing a job that involves Excel and most of all massively speed up your data analytics process.

Goal Seek

Goal seek is a function that allows you to find a desired outcome value, by changing fields in cells linked by formulas.

To better understand Goal seek, let's imagine an example from a real work scenario.

Department of Online Marketing. A client has just changed the budget for a campaign and you are required to do some re-planning with the new budget and re-calculate the client fees.

A traditional business model in advertising is that the client pays a percentage of the money spent on Facebook. Let's assume 10%.

So, if the client spends €50,000/month and pays 10% on top of the advertising spend, the client will give us €55,000 a month. €50,000 to spend online and €5,000 as our fee. The problem is that these are easy numbers and the client gives generally the total budget, so we need to deduct the fees on top of the budget and calculate the money to spend online backwards. So, these are the hypothesis and the scenario

Hypothesis

My Facebook Advertising Spend is	€ 50,000	This is what I want to calculate
I charge my client based on Advertising Spend	10%	
So my client total monthly fee is	€ 5,000	
And client total monthly budget is	€ 55,000	old budget

Problem

My client total monthy budget changes to	€ 28,523	new budget

So, I created a set of formulas through which I calculate the fees. Nevertheless, the formulas would work if I edited the Advertising Spend, and not the budget.

I don't want to change all my formulas now, **so I will get Goal seek to set one cell to a desired value, by changing another cell linked to it through a formula**.

Below you can see the formulas I setup in my table.

	D	E	F
4			
5	**Hypothesis**		
6	My Facebook Advertising Spend is	50000	This is what I want to calculate
7	I charge my client based on Advertising Spend	0.1	
8	So my client total monthly fee is	=E9-E6	
9	And client total monthly budget is	=E6*(E7+1)	old budget
10			
11	Problem		
12	My client total monthy budget changes to	28523	new budget
13			
14			

To use the Goal seek function

- Ribbon > Data > What-if Analysis

- Click on Goal Seek

For this exercise, I want to setup the cells that contains the old budget to €28,523 by changing the cells that contains €50,000, so I will be able to get the Facebook ad budget, whose 10% added on top will be = to my final budget.

Let goal seek work…Et voila!

Now I know that I can spend €25,930 on Facebook, to which, a 10% added on top will correspond the client total budget.

Hypothesis

My Facebook Advertising Spend is	€ 25,930	This is what I want to calculate
I charge my client based on Advertising Spend	10%	
So my client total monthly fee is	€ 2,593	
And client total monthly budget is	€ 28,523	new budget

Problem

My client total monthy budget changes to	€ 28,523	new budget

SumIF, CountIF, AverageIF

As you may get from the names, those formulas are a mix between IF and Sum, Count, Average. We are going to start from a dataset and make one of the 3 based on a condition we will input in the formula. We could spend a lot of times going through these formulas and all the possible variations, but being proficient in Excel requires also that you are able to pick up new concepts a bit faster, so now I will show you the formulas, practical examples and what are the formulas doing. By this point, you should be able to understand it fairly easily, which means that your skills are already improving.

In this example, we have a series of products and units sold in different countries from different sales reps. All I am interested in is understanding the total number of t-shirts sold. I am using the formula SUMIF to check column D, where I have the product name and look for "T-shirt", and if the value is found, I will get the function to add up the correspondent unit values in column E.

Region	Reps	Product	Units
Asia	Paul	T-shirt	531
Europe	Mike	Skirt	223
USA	Sally	Skirt	121
Australia	Jim	T-shirt	332
Asia	Paul	T-shirt	293
Asia	Paul	T-shirt	208
Australia	Sally	Trousers	744
Europe	Jim	Skirt	152
USA	Paul	Skirt	391
Europe	Mike	Trousers	373
USA	Sally	T-shirt	272

How many t-shirts have been sold?   1,636

SUMIF(Condition Range, Condition, Sum Range)
=SUMIF(D6:D16, "t-shirt", E6:E16)

The same applies for COUNTIF and AVERAGEIF functions.

If you don't need those numbers in a table but you just want them for your own calculations, you can simply

- Add filters to the table
- Sort the items by name so you can display them in order
- Select the numbers you want to add up, count or average
- Look in the Excel lower part of the interface, to see real time calculations

Region	Reps	Product	Units
Europe	Mike	Skirt	223
USA	Sally	Skirt	121
Europe	Jim	Skirt	152
USA	Paul	Skirt	391
Asia	Paul	T-shirt	531
Australia	Jim	T-shirt	332
Asia	Paul	T-shirt	293
Asia	Paul	T-shirt	208
USA	Sally	T-shirt	272
Australia	Sally	Trousers	744
Europe	Mike	Trousers	373

Sum   19. Sum If   20. Count If   21. Freeze Panes   2

Average: 327.2   Count: 5   Sum: 1636

Vlookup

Vlookup is one of the most important formulas you need to master to consider yourself proficient in Excel. Vlookup will allow you to find values within a dataset based on conditions.

To give you an example, let's imagine you have a data set like the below. This one has 11 rows and 4 columns, but it could be any size.

Customer	Product	Units	Region
Jim	Skirt	152	Spain
Joe	T-shirt	332	Australia
Mike	Skirt	223	Poland
Fred	Trousers	373	Portugal
Paul	Skirt	391	USA
Arnold	T-shirt	531	Asia
Joseph	T-shirt	293	Japan
Mark	T-shirt	208	China
Rita	Skirt	121	Russia
Robert	T-shirt	272	France
Paolo	Trousers	744	Australia

Syntax: =Vlookup(Cell you want to find, Range you want to analyse, Column Index, FALSE)

In this example, I want to find the column index 4 – REGION – within range B4:E11, and find the value associated to Joseph, which is in B10. The formula will return "Japan"

FALSE is a syntax part of the formula that will search for an exact match.

Customer	Product	Units	Region
Jim	Skirt	152	Spain
Joe	T-shirt	332	Australia
Mike	Skirt	223	Poland
Fred	Trousers	373	Portugal
Paul	Skirt	391	USA
Arnold	T-shirt	531	Asia
Joseph	T-shirt	293	Japan
Mark	T-shirt	208	China
Rita	Skirt	121	Russia
Robert	T-shirt	272	France
Paolo	Trousers	744	Australia

Vlookup
Japan

Now check this.

- Click on the cell to step in the formula
- Click on B10 (joseph) and simply **drag the cell outside** in G10 – so the values you want to find with the formula will now point to G10, outside the table

Now the Vlookup will search through the data range, but instead of looking for the value in B10, which is in the table, it will search from the value in G10.

You can manually type in any name in G10, and the Vlookup will return the right region.

If I type Paul in G10, the Vlookup will show USA

Customer	Product	Units	Region
Jim	Skirt	152	Spain
Joe	T-shirt	332	Australia
Mike	Skirt	223	Poland
Fred	Trousers	373	Portugal
Paul	Skirt	391	USA
Arnold	T-shirt	531	Asia
Joseph	T-shirt	293	Japan
Mark	T-shirt	208	China
Rita	Skirt	121	Russia
Robert	T-shirt	272	France
Paolo	Trousers	744	Australia

Who do you want to find?
Paul

Vlookup
USA

If I type Rober in G10, the Vlookup will show France.

Customer	Product	Units	Region
Jim	Skirt	152	Spain
Joe	T-shirt	332	Australia
Mike	Skirt	223	Poland
Fred	Trousers	373	Portugal
Paul	Skirt	391	USA
Arnold	T-shirt	531	Asia
Joseph	T-shirt	293	Japan
Mark	T-shirt	208	China
Rita	Skirt	121	Russia
Robert	T-shirt	272	France
Paolo	Trousers	744	Australia

Who do you want to find?
Robert

Vlookup
France

When you are managing large data sets, a Vlookup at the right place, is the way to see through your data in a blink of an eye.

Let's see another interesting example that can save you quite some in a lot of tricky situations.
We have created a Vlookup, we added a dynamic cell to it.
But we still have to manually type the name to let the function analyse the table.
What if we didn't want to type the name every time?
Let's create a **drop-down list** and let's place it in G10, so we won't have to type the names, we will just have to select them from a list.

- Create a list of unique names you want in a safe spot in the file (follow the image)
- Select G10, the cell we want to change.
- From the Ribbon > Data > Data Validation
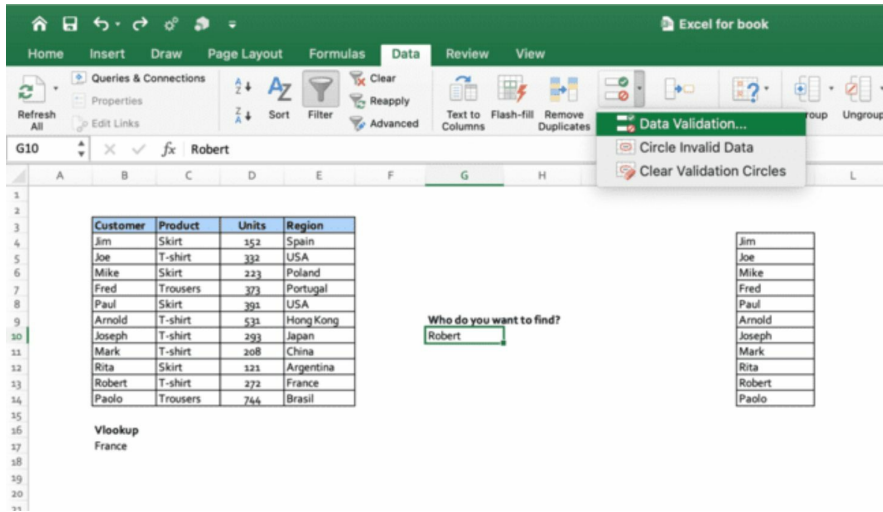
- Select List among the available options in the drop-down
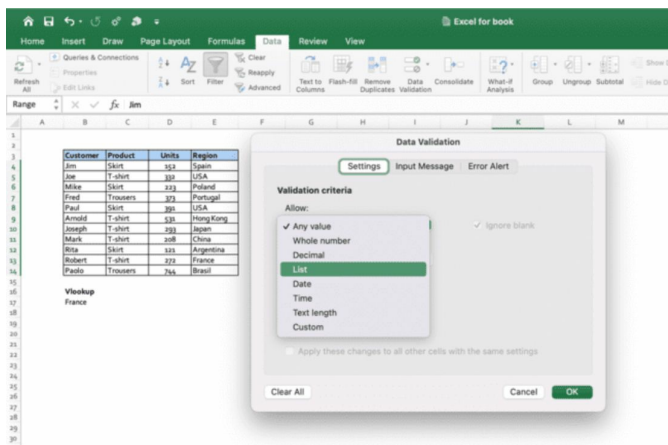
- Add the range with the list you just created to the Source box
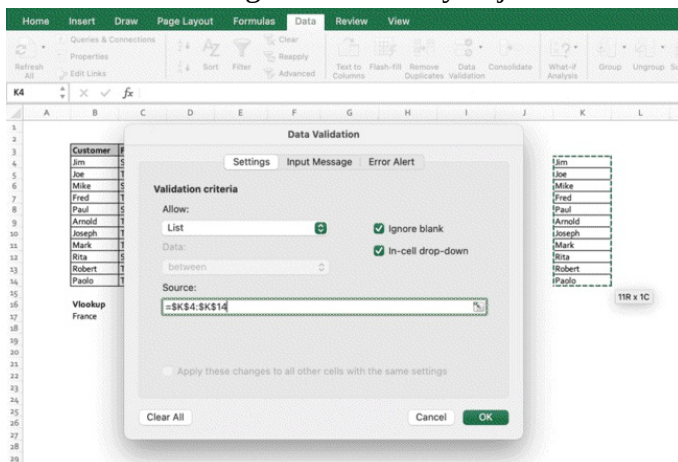
- Press Enter…et voila'! A beautiful fast dropdown list you can now select the values from

This type of process can be used for many purposes.

You can use Vlookup and dropdown lists in a variety of different ways, in combination with other functions, or by themselves, depending on what you need to do. Those are the tools.
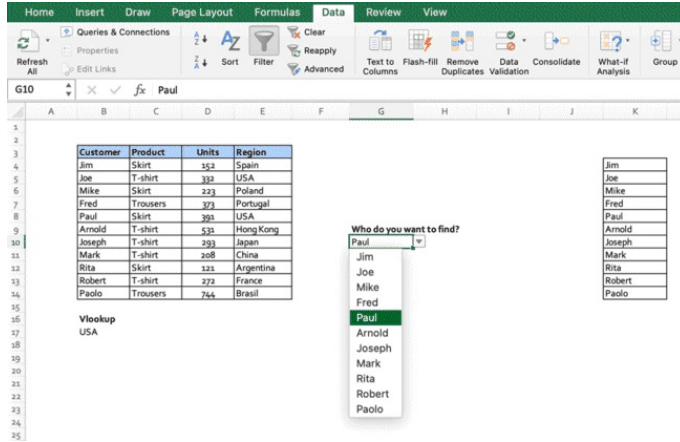
Let's see now another interesting use for the Vlookup: let's create a separate table, where we categorize the countries by continent. How do we add this information (Continent) to our table, and set it up so it can get updated in real time?

This example of Vlookup can be particularly useful when you have data (Country) and you want to add extra fields automatically (Continent) because you need them regularly for your analysis, but you are not receiving them in the original dataset. So, Vlookup will be used to linked the 2 tables.

Customer	Product	Units	Region
Jim	Skirt	152	Spain
Joe	T-shirt	332	USA
Mike	Skirt	223	Poland
Fred	Trousers	373	Portugal
Paul	Skirt	391	USA
Arnold	T-shirt	531	Hong Kong
Joseph	T-shirt	293	Japan
Mark	T-shirt	208	China
Rita	Skirt	121	Argentina
Robert	T-shirt	272	France
Paolo	Trousers	744	Brasil

Auxiliary Table

Country	Continent
USA	USA
Argentina	South America
Brasil	South America
Spain	Europe
italy	Europe
Poland	Europe
Portugal	Europe
France	Europe
Hong Kong	Asia
Japan	Asia
China	Asia

You can do it by using the Vlookup function, you will select the range of the new auxiliary table, and you will automatically associate the value in region to the column number 2 of the range (continent)

SUM | × ✓ *fx* =VLOOKUP(E4,I4:J14, 2,FALSE)

	A	B	C	D	E	F	G	H	I	J	K
1											
2										Auxiliary Table	
3		Customer	Product	Units	Region				Country	Continent	
4		Jim	Skirt	152	Spain	=VLOOKUP(E4,I4:J14, 2,FALSE)			USA	USA	
5		Joe	T-shirt	332	USA				Argentina	South America	
6		Mike	Skirt	223	Poland				Brasil	South America	
7		Fred	Trousers	373	Portugal				Spain	Europe	
8		Paul	Skirt	391	USA				italy	Europe	
9		Arnold	T-shirt	531	Hong Kong				Poland	Europe	
10		Joseph	T-shirt	293	Japan				Portugal	Europe	
11		Mark	T-shirt	208	China				France	Europe	
12		Rita	Skirt	121	Argentina				Hong Kong	Asia	
13		Robert	T-shirt	272	France				Japan	Asia	
14		Paolo	Trousers	744	Brasil				China	Asia	
15											
16											
17											
18											

Don't forget to lock the range using absolute reference, otherwise as you drag the formula down, you will also drag the range down, and this will result in errors. Simply add a $ before and after each row and column in the cells that define the range

Format | B *I* U | | | | | | Merge & Centre ▾

× ✓ *fx* =VLOOKUP(E4,$I$4:$J$14, 2,FALSE)

B	C	D	E	F	G	H	I	J
							Auxiliary Table	
Customer	Product	Units	Region	Vlookup			Country	Continent
Jim	Skirt	152	Spain	=VLOOKUP(E4,$I$4:$J$14, 2,FALSE)			USA	USA
Joe	T-shirt	332	USA	USA			Argentina	South America
Mike	Skirt	223	Poland	Europe			Brasil	South America
Fred	Trousers	373	Portugal	Europe			Spain	Europe

This way, you will have no formula when dragging down the formula.

Customer	Product	Units	Region			Auxiliary Table	
						Country	Continent
Jim	Skirt	152	Spain	Europe		USA	USA
Joe	T-shirt	332	USA	USA		Argentina	South America
Mike	Skirt	223	Poland	Europe		Brasil	South America
Fred	Trousers	373	Portugal	Europe		Spain	Europe
Paul	Skirt	391	USA	USA		italy	Europe
Arnold	T-shirt	531	Hong Kong	Asia		Poland	Europe
Joseph	T-shirt	293	Japan	Asia		Portugal	Europe
Mark	T-shirt	208	China	Asia		France	Europe
Rita	Skirt	121	Argentina	South America		Hong Kong	Asia
Robert	T-shirt	272	France	Europe		Japan	Asia
Paolo	Trousers	744	Brasil	=VLOOKUP(E14,$I$4:$J$14, 2,FALSE)		China	Asia

The advantage of this is that, when you receive the new data, **you can copy – paste it over the**

old data, without touching the Vlookup formulas, and the values will be automatically updated

Week 1 - data

Customer	Product	Units	Region	Vlookup		Auxiliary Table	
						Country	Continent
Jim	Skirt	152	Spain	Europe		USA	USA
Joe	T-shirt	332	USA	USA		Argentina	South America
Mike	Skirt	223	Poland	Europe		Brasil	South America
Fred	Trousers	373	Portugal	Europe		Spain	Europe
Paul	Skirt	391	USA	USA		italy	Europe
Arnold	T-shirt	531	Hong Kong	Asia		Poland	Europe
Joseph	T-shirt	293	Japan	Asia		Portugal	Europe
Mark	T-shirt	208	China	Asia		France	Europe
Rita	Skirt	121	Argentina	South America		Hong Kong	Asia
Robert	T-shirt	272	France	Europe		Japan	Asia
Paolo	Trousers	744	Brasil	South America		China	Asia

Week 2 – data (copy – paste the new data over, Vlookup column updates, Auxiliary table doesn't change and it's there to reference the range. You can update Auxiliary Table over time and update the range in the Vlookup formula)

Customer	Product	Units	Region	Vlookup		Auxiliary Table	
						Country	Continent
Rita	Skirt	121	Argentina	South America		USA	USA
Paolo	Trousers	744	Brasil	South America		Argentina	South America
Mark	T-shirt	208	USA	USA		Brasil	South America
Robert	T-shirt	272	France	Europe		Spain	Europe
Arnold	T-shirt	531	Poland	Europe		italy	Europe
Joseph	T-shirt	293	Poland	Europe		Poland	Europe
Mike	Skirt	223	Poland	Europe		Portugal	Europe
Fred	Trousers	373	Portugal	Europe		France	Europe
Jim	Skirt	152	USA	USA		Hong Kong	Asia
Joe	T-shirt	332	USA	USA		Japan	Asia
Paul	Skirt	391	USA	USA		China	Asia

The most recent versions of Excel have also a formula named XLOOKUP.

The new XLOOKUP formula has the solutions to some of VLOOKUP's biggest limitations. It also replaces HLOOKUP (used to search for a value in the top row of an array of values). XLOOKUP can search to its left, the default is an exact match, and allows you to specify a range of cells instead of a column number. XLOOKUP function is only available in Excel for, Excel 2021, Microsoft 365 and Excel for the web, you can upgrade your Excel to the available version to get XLOOKUP.

Excel shortcuts & formulas to create massive automation

We will now go through a list of the most important formulas for professionals

To show current date and time in a cell. Select cell

✂ **SHORTCUT** (Today Date): CTRL + ;

✂ **SHORTCUT** (Current Time): CTRL + Shift + :

Ctrl + ;	Ctrl + Shift + :
Current Day	**Current Time**
06/07/2022	18:20

To format cells with date and time format

✂ **SHORTCUT** (Date): CTRL + #

✂ **SHORTCUT** (Time): CTRL + Shift + : @

Ctrl+Shift+#	Ctrl+Shift+@
Date	**Time**
02-Jul	03:20
03-Jul	04:20
04-Jul	05:20
05-Jul	06:20
06-Jul	07:20
07-Jul	08:20
08-Jul	09:20
09-Jul	10:20
10-Jul	11:20

You can use the formula =Today() to display the current day in real time. Every time you will open your Excel file, the cell with this formula will show you the current day.

You can create simple formulas that auto-update, such as the time period (days) from Today and a specific date in the past. In the example below

- Today will change every day
- Start date can be changed manually
- Time period will tell you every day how much time has passed since the start date
- This will all happen automatically without you having to do anything else

Extract Day, Month, Year from a date

Imagine you receive a data set with a daily breakdown. How do you go from a date to its day, month, year and add it to the table in seconds? Use the Text Function

◆◆ Day =TEXT (cell reference, "dddd")

◆◆ Month =TEXT (cell reference, "mmmm")

◆◆ Year =TEXT (cell reference, "yyyy")

In day and month, the number of letters you will type in the second part of the formula will determine how many letters will be shown from the function.

In the example below we can see a dynamic table with

- Today date in C5, it will change every day automatically
- Text functions linked to D5 will update accordingly
- You can start from this model to create your first calendar in Excel

Here we can see another example

Date	"dddd" or "ddd" Day	"mmmm" or "mmm" Month	"yyyy" or "yyy" Year
01/01/20	Wednesday	January	2020
03/01/20	Friday	January	2020
01/02/20	Saturday	February	2020
01/02/20	Saturday	February	2020
01/01/20	Wednesday	January	2020
05/01/20	Sunday	January	2020
09/02/20	Sunday	February	2020
04/01/21	Monday	January	2021
04/05/20	Monday	May	2020
01/01/23	Sunday	January	2023
01/12/22	Thursday	December	2022
09/01/20	Thursday	January	2020
01/01/21	Friday	January	2021

This formula can also massively speed up your work when it comes to data analytics. Imagine you receive a data set with a daily breakdown and you need to analyse it

Website Visits	Date
4,667	23-Jun
9,706	24-Jun
8,683	25-Jun
2,301	26-Jun
3,480	27-Jun
6,167	28-Jun
7,867	29-Jun
8,150	30-Jun
4,179	01-Jul
7,827	02-Jul
4,939	03-Jul
7,936	04-Jul
8,403	05-Jul
5,294	06-Jul
7,432	07-Jul
7,052	08-Jul
11,064	09-Jul
9,078	10-Jul
7,809	11-Jul

Scan QR code for the video reel version

You can use this function to add the day to any file in seconds when needed.

As for the previous example, if you copy-paste new data ensuring that column D points at column C, you will be able to retrieve the day of the week from your data set. Then, using the techniques we have covered, you can do a day of the week analysis to see if you notice patterns (filters, slicers, charts)

Freeze Panes

What does "Freezing Panes" in Excel means?

It's very simple: if you have a big range of data and you want to scroll through it by maintaining specific rows and columns always visible… you are about to learn how to do it.

- Select a cell and click it. In this example we will select cell B4 (Jim)
- Ribbon > View > Freeze Panes

This will freeze every cell above B4 and every cell on B4 left

This is particularly useful when you have large datasets and you want to scroll up-down and left-right without losing sight of your data
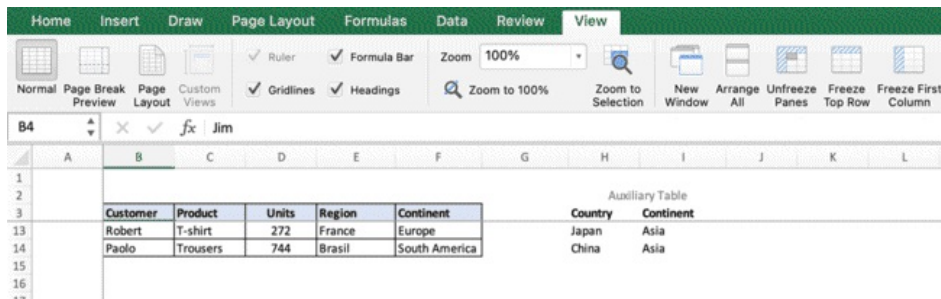
Click on view to restore the instruction and unfreeze everything. You can also decide to free the top row only or the first column only
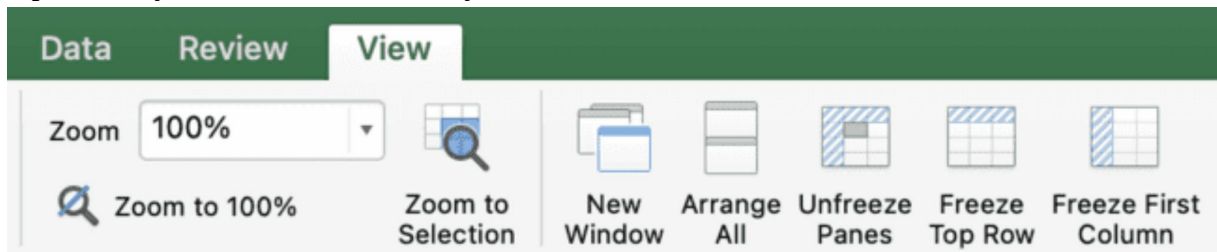
Concatenate Text and Numbers

We have previously learnt how to concatenate two cells with text. Now we want to concatenate a cell with a string value and a cell with a numerical value.

This formula may look complex at first. The key to understand it is the following

- Put the text between " "
- Put the cells references between & &

This is going to be the starting table

Region	Reps	Product	Units
Asia	Paul	T-shirt	531
Europe	Mike	Skirt	223
USA	Sally	Skirt	121
Australia	Jim	T-shirt	332

Checkout the formula.

The cells references are between & &, while the text is in between " "

The goal is to incorporate dynamic cell values with static text, and automate the commentary

Press Enter to confirm. You just created a concatenated text

L27		✗ ✓	fx						
	A	B	C	D	E	F	G	H

	Region	Reps	Product	Units
	Asia	Paul	T-shirt	531
	Europe	Mike	Skirt	223
	USA	Sally	Skirt	121
	Australia	Jim	T-shirt	332

Comment

In Asia we sold 531 T-shirt during the first quarter of 2021

Drag your formula down

SUM		✗ ✓	fx	="In "&B9&" we sold "&E9&" "&D9&" during the first quarter of 2021"					
	A	B	C	D	E	F	G	H	I

	Region	Reps	Product	Units
	Asia	Paul	T-shirt	531
	Europe	Mike	Skirt	223
	USA	Sally	Skirt	121
	Australia	Jim	T-shirt	332

Comment

In Asia we sold 531 T-shirt during the first quarter of 2021
In Europe we sold 223 Skirt during the first quarter of 2021
In USA we sold 121 Skirt during the first quarter of 2021
="In "&B9&" we sold "&E9&" "&D9&" during the first quarter of 2021"

Replace data in the data set via copy-paste and the comment will auto-update

Region	Reps	Product	Units
Asia	Paul	Jumpers	531
Europe	Mike	Trousers	223
USA	Sally	Jackets	121
Australia	Jim	T-shirt	332

Comment
In Asia we sold 531 Jumpers during the first quarter of 2021
In Europe we sold 223 Trousers during the first quarter of 2021
In USA we sold 121 Jackets during the first quarter of 2021
In Australia we sold 332 T-shirt during the first quarter of 2021

Add comments

To add comments in Excel. S elect the cell you want to comment

✂ **SHORTCUT:** SHIFT + F

Hover over to display the popup with the comment

T o delete: Right Click > Delete Comment

Insert Hyperlink

This Excel shortcuts will allow you to embed a URL into a cell value and make it clickable.

In this example, we will add our Tutorial playlist from our Youtube Channel and paste the URL

https://www.youtube.com/channel/UC_CgkwIL3XdKVNFJBgm6lcg/playlists

to the cell with the text Link >>

✂ **SHORTCUT:** CTRL+ K

Type in the URL or paste it if you have previously copied it

Region	Reps	Product	Units
Asia	Paul	Jumpers	531
Europe	Mike	Trousers	223
USA	Sally	Jackets	121
Australia	Jim	T-shirt	332

Comment
In Asia we sold 531 Jumpers during the first quarter of 2021

For more tutorials, check our Youtube Playlist   Link >>

Click OK.
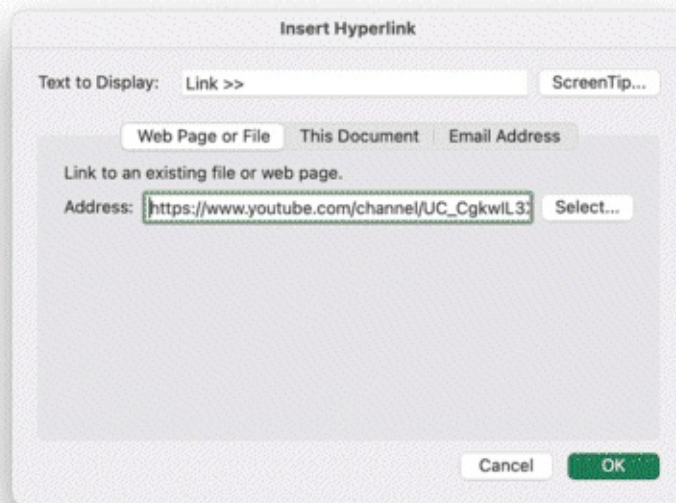
Your cell is now a clickable link. You can click it to be redirected to the link, or edit the link by selecting the cell and pressing again CTRL + K. A useful command that will allow you to keep everything in the same place, in case you need it.

Paste Special

When you copy-paste / cut – paste data, you may notice a small notepad icon in the bottom right corner of the data set you have pasted. When you click it, an option panel will open and you will be able to tell excel how you want your data to be pasted.
We will cover here only the main options, as the way it works is pretty intuitive and, when you paste data, you just have to hover over the different options to see data changes in real time

Transpose

In Excel, Transpose means changing rows into columns and vice versa.

Let's see an example.

Imagine you a column like this and you want to convert it into a row

Simply copy-paste your data, click on the icon and select Transpose
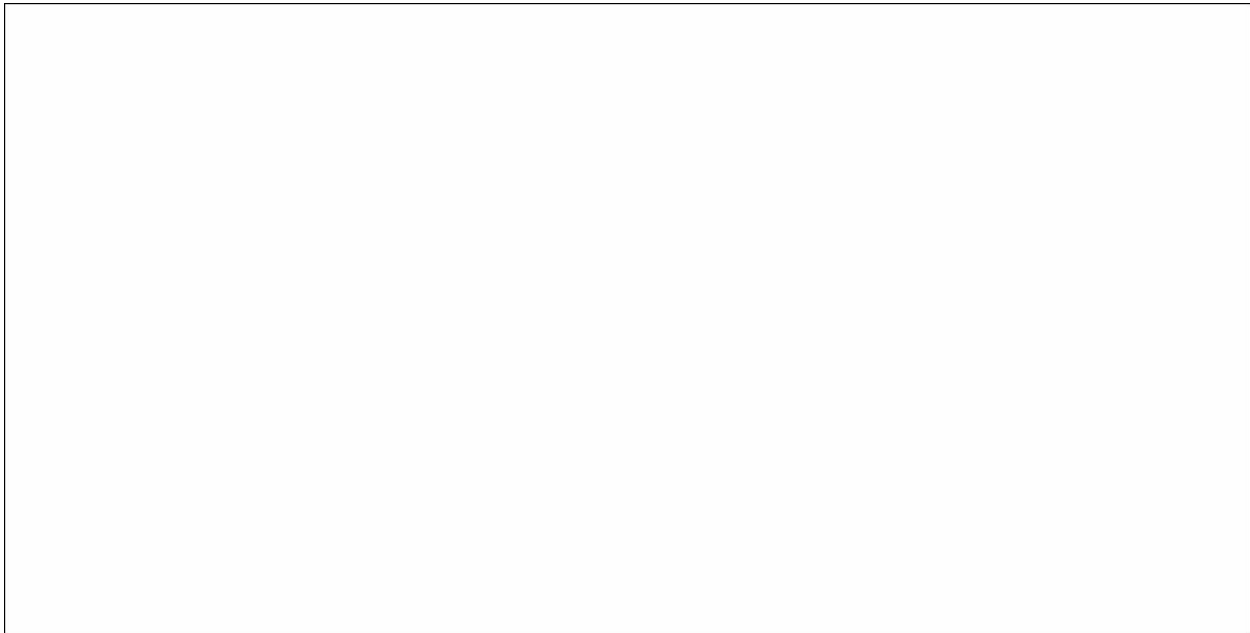
Month	Month
January	January
February	February
March	March
April	April
May	May
June	June
July	July
August	August

Paste

✓ Paste

Formulas

Formulas & Number Formatting

Keep Source Formatting

No Borders

Keep Source Column Widths

Transpose

Paste Values

Paste Values

Values & Number Formatting

Values & Source Formatting
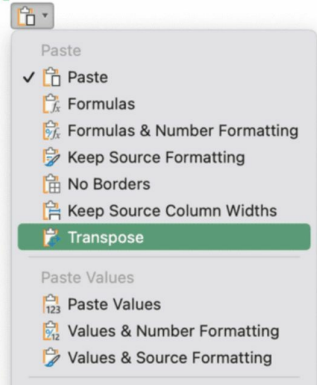
And you can easily switch from row to column and vice versa.

Index + Match

Index match is a way to perform advanced lookup. It allows to do different types of lookups very fast and flexibly. Let's start with Index. The formula will return Robert, which is at index 4 in the selected range)

	Customer	Product	Units	Region
1	Rita	Skirt	121	Argentina
2	Paolo	Trousers	744	Brasil
3	Mark	T-shirt	208	China
4	Robert	T-shirt	272	France
5	Arnold	T-shirt	531	Hong Kong
6	Joseph	T-shirt	293	Japan
7	Mike	Skirt	223	Poland
8	Fred	Trousers	373	Portugal
9	Jim	Skirt	152	Spain
10	Joe	T-shirt	332	USA
11	Paul	Skirt	391	USA

Customer
Robert

Now, I want to understand what product Robert has bought. I will use the same function but I will extend the selection to the entire table, and in the second part of the formula, I will add rows and columns index)

	A	B	C	D	E	F	G	H
3								
4		1	2	3	4			
5		Customer	Product	Units	Region			
6	1	Rita	Skirt	121	Argentina		Product	
7	2	Paolo	Trousers	744	Brasil		=INDEX(B6:E16, 4, 2)	
8	3	Mark	T-shirt	208	China			
9	4	Robert	T-shirt	272	France			
10	5	Arnold	T-shirt	531	Hong Kong			
11	6	Joseph	T-shirt	293	Japan			
12	7	Mike	Skirt	223	Poland			
13	8	Fred	Trousers	373	Portugal			
14	9	Jim	Skirt	152	Spain			
15	10	Joe	T-shirt	332	USA			
16	11	Paul	Skirt	391	USA			
17								
18								

	1	2	3	4		
	Customer	Product	Units	Region		
1	Rita	Skirt	121	Argentina		
2	Paolo	Trousers	744	Brasil		Product
3	Mark	T-shirt	208	China		T-shirt
4	Robert	T-shirt	272	France		
5	Arnold	T-shirt	531	Hong Kong		
6	Joseph	T-shirt	293	Japan		
7	Mike	Skirt	223	Poland		
8	Fred	Trousers	373	Portugal		
9	Jim	Skirt	152	Spain		
10	Joe	T-shirt	332	USA		
11	Paul	Skirt	391	USA		

Match

The Match function allows to insert a value belonging to a data set and get the index in return

In this example, the function returns 5, which is the row index of Arnold, in the Range (B6:B16)

0 is added for the exact match.

	A	B	C	D	E	F	G	H
3								
4		1	2	3	4			
5		Customer	Product	Units	Region			
6	1	Rita	Skirt	121	Argentina		Match	
7	2	Paolo	Trousers	744	Brasil		5	
8	3	Mark	T-shirt	208	China			
9	4	Robert	T-shirt	272	France			
10	5	Arnold	T-shirt	531	Hong Kong			
11	6	Joseph	T-shirt	293	Japan			
12	7	Mike	Skirt	223	Poland			
13	8	Fred	Trousers	373	Portugal			
14	9	Jim	Skirt	152	Spain			
15	10	Joe	T-shirt	332	USA			
16	11	Paul	Skirt	391	USA			
17								
18								

Match can also be used horizontally

We can combine Index and Match together.

Index and Match

First, let's start with Index. Just to recap, I select the data range, the row number and the column number. The following function will return Japan (Row 6, Column 4)

Press Enter to confirm

Let's take the formula one step further and let's replace the row number in Index (6) with a Match expression. We want to Match the name Joseph within the array B4:B14 and find an exact match. As you may notice, the column number for the Index function at the end of the expression hasn't changed.

| SUM | | ✕ ✓ fx | =INDEX(B4:E14, MATCH("Joseph", B4:B14, 0), 4) | | | | | | |

INDEX(array, row_num, [column_num])
INDEX(reference, row_num, [column_num], [area_num])

	A	B	C				H	I	J
1		1	2	3	4				
2		Customer	Product	Units	Region				
3		1 Rita	Skirt	121	Argentina		Index		
4		2 Paolo	Trousers	744	Brasil		=INDEX(B4:E14, MATCH("Joseph", B4:B14, 0), 4)		
5		3 Mark	T-shirt	208	China				
6		4 Robert	T-shirt	272	France				
7		5 Arnold	T-shirt	531	Hong Kong				
8		6 Joseph	T-shirt	293	Japan				
9		7 Mike	Skirt	223	Poland				
10		8 Fred	Trousers	373	Portugal				
11		9 Jim	Skirt	152	Spain				
12		10 Joe	T-shirt	332	USA				
13		11 Paul	Skirt	391	USA				

Press Enter to confirm. We have now the same result as before, but now we made the formula more flexible.

	1	2	3	4		
	Customer	Product	Units	Region		
1	Rita	Skirt	121	Argentina		Index Match
2	Paolo	Trousers	744	Brasil		Japan
3	Mark	T-shirt	208	China		
4	Robert	T-shirt	272	France		
5	Arnold	T-shirt	531	Hong Kong		
6	Joseph	T-shirt	293	Japan		
7	Mike	Skirt	223	Poland		
8	Fred	Trousers	373	Portugal		
9	Jim	Skirt	152	Spain		
10	Joe	T-shirt	332	USA		
11	Paul	Skirt	391	USA		

Let's take it one step further and let's replace "Joseph" by linking that part of the formula to G10, an empty cell that we will fill in manually

| SUM | | ✕ ✓ fx | =INDEX(B4:E14, MATCH(G10, B4:B14, 0), 4) | | | | | | | |

	A	B	C	D	E	F	G	H	I	J
1										
2		1	2	3	4					
3		Customer	Product	Units	Region					
4		1 Rita	Skirt	121	Argentina		Index Match			
5		2 Paolo	Trousers	744	Brasil		=INDEX(B4:E14, MATCH(G10, B4:B14, 0), 4)			
6		3 Mark	T-shirt	208	China					
7		4 Robert	T-shirt	272	France					
8		5 Arnold	T-shirt	531	Hong Kong					
9		6 Joseph	T-shirt	293	Japan		Name to find			
10		7 Mike	Skirt	223	Poland					
11		8 Fred	Trousers	373	Portugal					
12		9 Jim	Skirt	152	Spain					
13		10 Joe	T-shirt	332	USA					
14		11 Paul	Skirt	391	USA					

As you can see when we press Enter, we see an error message. This is because for now the cell is empty so Index and Match can't find that value within the ranges they operate.

	1	2	3	4
	Customer	Product	Units	Region
1	Rita	Skirt	121	Argentina
2	Paolo	Trousers	744	Brasil
3	Mark	T-shirt	208	China
4	Robert	T-shirt	272	France
5	Arnold	T-shirt	531	Hong Kong
6	Joseph	T-shirt	293	Japan
7	Mike	Skirt	223	Poland
8	Fred	Trousers	373	Portugal
9	Jim	Skirt	152	Spain
10	Joe	T-shirt	332	USA
11	Paul	Skirt	391	USA

Index Match

#N/A

Name to find

As we change the value in G10, the result of Index Match changes in real time.
With this simple strategy, you can search through database in real time, input a parameter and find the information you are interested in with one click.

	1	2	3	4
	Customer	Product	Units	Region
1	Rita	Skirt	121	Argentina
2	Paolo	Trousers	744	Brasil
3	Mark	T-shirt	208	China
4	Robert	T-shirt	272	France
5	Arnold	T-shirt	531	Hong Kong
6	Joseph	T-shirt	293	Japan
7	Mike	Skirt	223	Poland
8	Fred	Trousers	373	Portugal
9	Jim	Skirt	152	Spain
10	Joe	T-shirt	332	USA
11	Paul	Skirt	391	USA

Index Match

Poland

Name to find

Mike

	1	2	3	4
	Customer	Product	Units	Region
1	Rita	Skirt	121	Argentina
2	Paolo	Trousers	744	Brasil
3	Mark	T-shirt	208	China
4	Robert	T-shirt	272	France
5	Arnold	T-shirt	531	Hong Kong
6	Joseph	T-shirt	293	Japan
7	Mike	Skirt	223	Poland
8	Fred	Trousers	373	Portugal
9	Jim	Skirt	152	Spain
10	Joe	T-shirt	332	USA
11	Paul	Skirt	391	USA

Index Match

China

Name to find

Mark

In case you want to change the ranges, simply click on the formula, then click on the ranges borders or corners to move them or resize them as you need.

	1	2	3	4
	Customer	Product	Units	Region
1	Rita	Skirt	121	Argentina
2	Paolo	Trousers	744	Brasil
3	Mark	T-shirt	208	China
4	Robert	T-shirt	272	France
5	Arnold	T-shirt	531	Hong Kong
6	Joseph	T-shirt	293	Japan
7	Mike	Skirt	223	Poland
8	Fred	Trousers	373	Portugal
9	Jim	Skirt	152	Spain
10	Joe	T-shirt	332	USA
11	Paul	Skirt	391	USA

Index Match

=INDEX(C7:F19, MATCH(H13, B4:B20, 0), 4)

Name to find

Mark

Chapter 9: Uses of Microsoft Excel

What can you do with Excel?

A quick list of tasks that can be practically done with Excel at the workplace, you should now start seeing many of these more clearly.

1. Data Entry and storage
2. Collection and verification of business data
3. Administrative and managerial duties
4. Accounting and budgeting
5. Data analysis
6. Reporting and data visualisation
7. Forecasting
8. Managing product information
9. Stock and inventory management
10. Business task automation
11. Compiling, managing and mailing contact lists
12. Checklists, time-logs, to-do lists
13. CRM creation and management
14. Calendars and schedules
15. Goal planning
16. Mock-ups
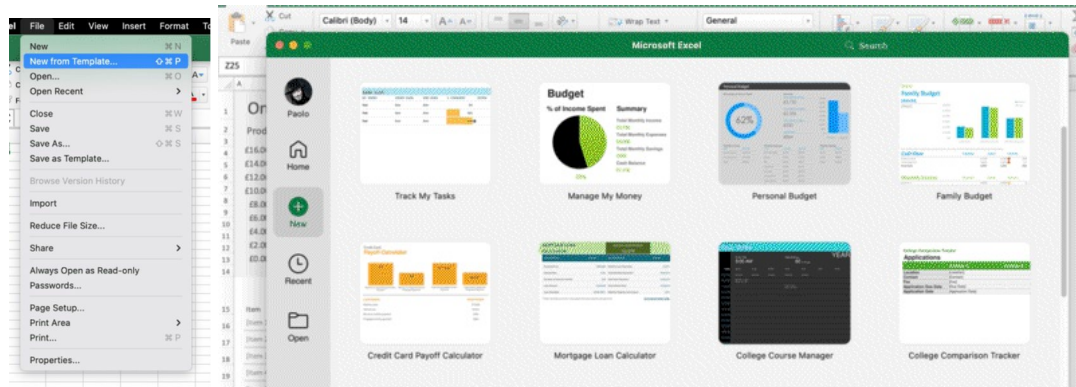17. Project Management charts
18. Forms

Templates

What are Excel Templates?

Templates are pre-made spreadsheets with formulas and charts you can open and customise to your needs. You can use template for multiple purposes.

Click on File > New from Template

A window with the templates will pop up. Scroll through the templates and double click to open.

You can open a beautiful Personal Budget Template with tables and charts. You can customise the template as you need and personalise it, change formulas, add or remove items
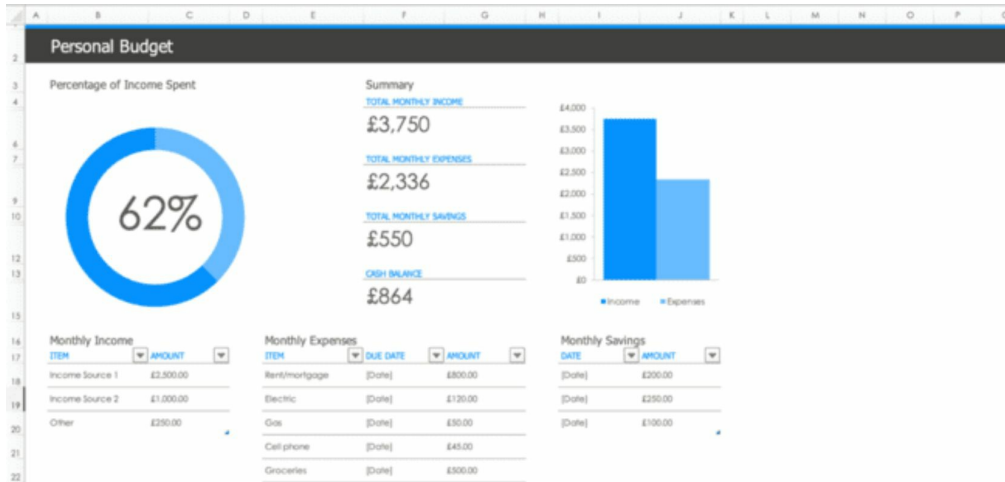
Before start working, Save the File as New. You will essentially duplicate the document and save it with a new name. This is because you want to keep track of all your changes and work with structure.

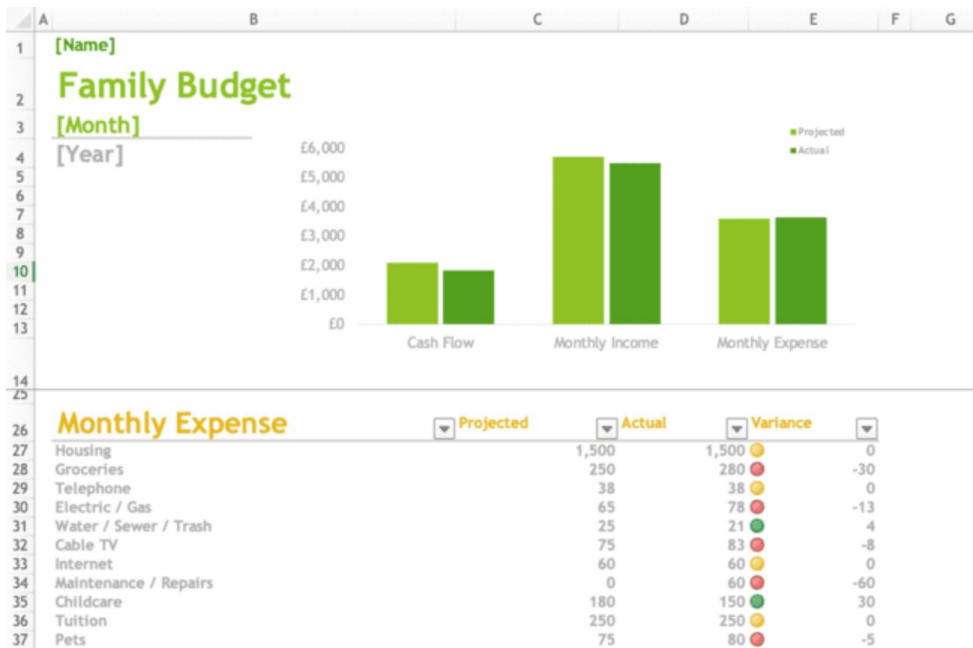Save the file as new every time you need to make a copy.

✂ **SHORTCUT:** CTRL + S

⏱ **MANUAL:** Click on File > Save as New

Name the file, select where to save it and confirm.

You can select a very useful Family Budget Template. The idea is creating a spreadsheet you can keep updated every month and keep track of your income and expenses in real time

You can use the list templates if you simply need to make a list or calculate expenses on a separate file or a separate sheet. Millions of people in the world use Excel on a day-to-day basis as a task organisation tool.

TASK OR TITLE

MAKE A LIST

DATE	ITEM	NOTES
Date	Item	Note
Date	Item	Note
Date	Item	Note
Date	Item	Note

Total a List

Total

£139.00

Item	Cost
Item	£22.00
Item	£102.00
Item	£15.00

TASK LIST

MY TASKS	START DATE	DUE DATE	% COMPLETE	NOTES
Task	Date	Date	0%	
Task	Date	Date	50%	
Task	Date	Date	100%	

You can use the Budget Template and customise it in no time.

Remove rows, columns, cell, update formula ranges by stepping in cell formulas and drag ranges or change them from the formula bar.
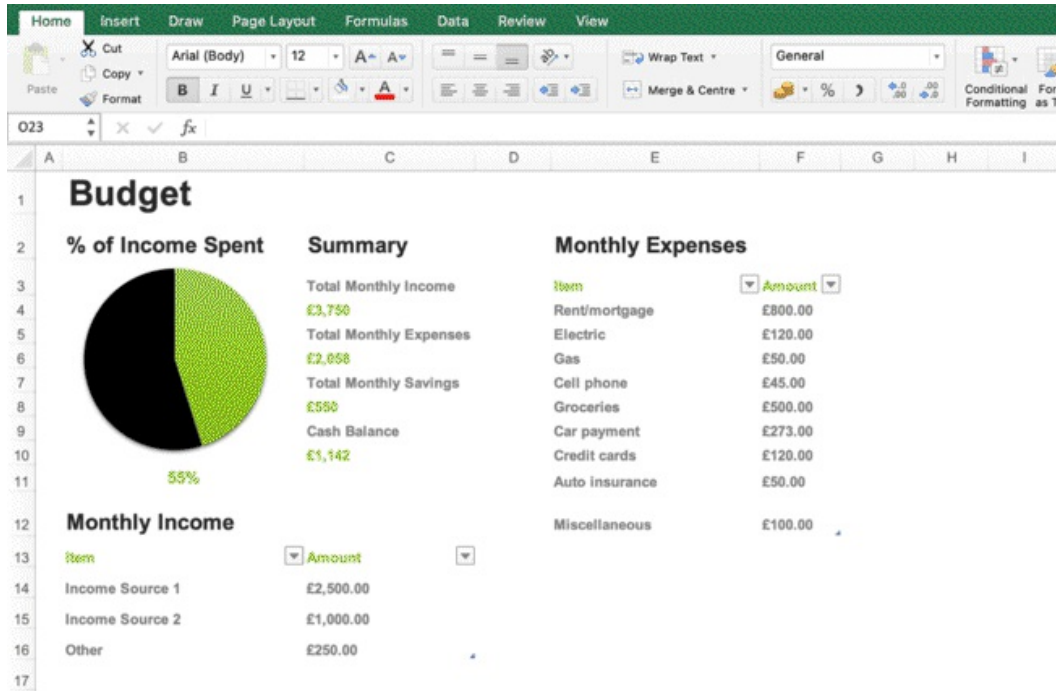
If you work in sales or online sales, you can check out the Online Sales Tracker Template, where you can connect spend data and sales data from different data sources and use Excel to create data connections.
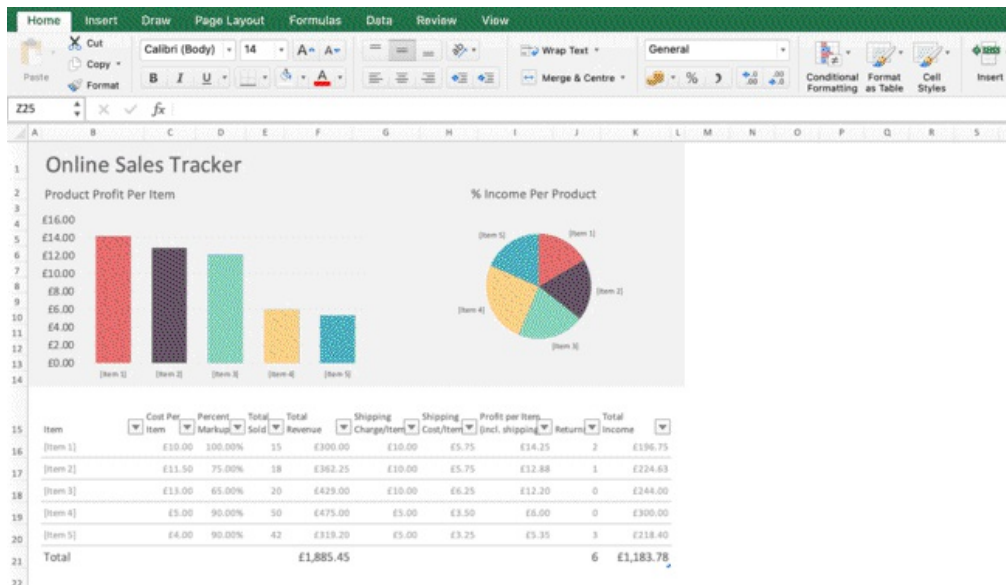
Excel is also widely use to do Financial Reports. You can use this template, study it, get inspired, notice how being able to create client friendly dashboards is actually a big part of the data analytics process.

Not only you have to be able to clean, organize and analyse data, but also putting attention on the delivery, and aesthetics is a big part of the picture, often bigger than you may realise.

Notice how you can organize the most important information and lay them out in a clear, concise way.

The below is a mix of text, tables, charts, potentially linked to an interactive dashboard in another sheet where you have done all your main calculations, formulas, charts, and now you are just displaying them in a beautiful, clean client report.
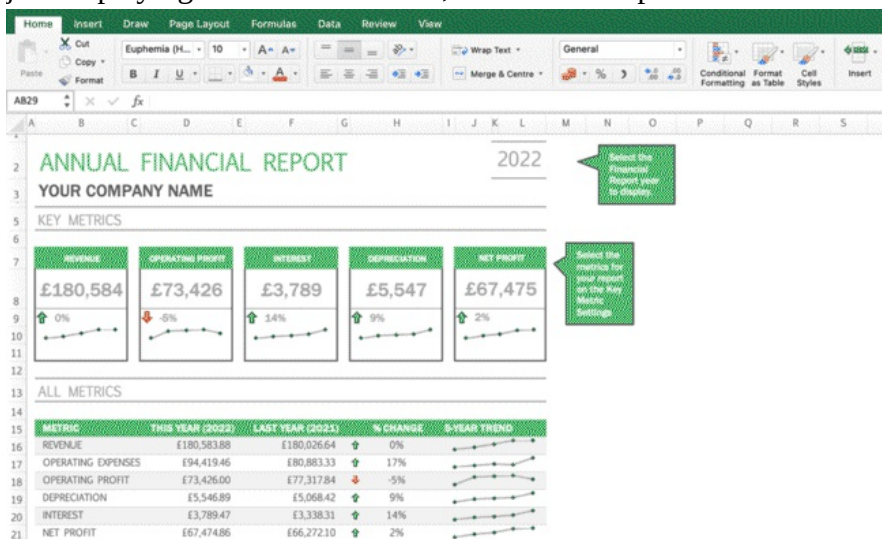
✏ **NOTE:** In case you are wondering: those lines are called SPARKLINES, and allow you to create a small chart in a cell. We didn't cover them as they would pertain to a course specific to charts and reporting.
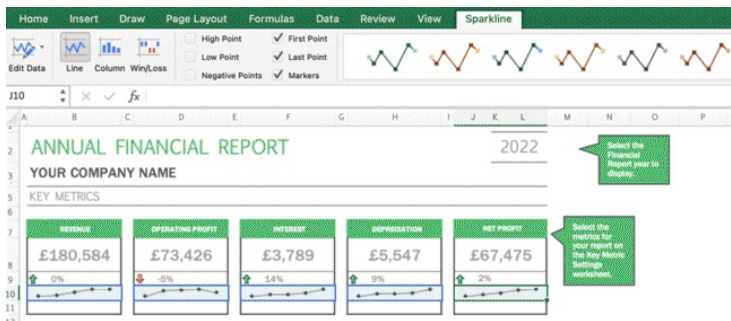
You can use Templates for credit card payoff calculations, assignment schedules, daily schedules, calendars, budgeting, planning, inventory, workout log, invoicing, expense tracking

and more.

You can create your own template and use it to store information as a CRM database.

You can also download templates online, **but always make sure you trust the source**.

Chapter 11: How to Take Excel Charts to the Next Level

After all these years working with Excel and Business Intelligence software, we asked ourself a question:

Why does creating beautiful charts have to take so long?

A few years back, I was working in social media advertising with my business partner, Paolo. We were managing budgets in the millions for the biggest brands on the planet. We were spending a lot of time doing the same tasks over and over, wasting a lot of time in formatting activities, creating tables and charts and spending a big portion of the time to automate them and make them client friendly. Over the years, we have tried different solutions, created our own automation with Visual Basic, Power Query, Power BI…but no matter how hard we tried to automate our process, we often ended up doing a lot of manual work, which would put us under pressure, given the high number of clients, campaigns and platforms.

So, one day, we came up with a solution.

What if we could do all of this, in just under 5 minutes a week?

That day, we created Reporting King.

Reporting King is a software to transform a raw data file in Excel into a beautiful interactive dashboard and a client report in minutes.

Reporting King is designed to achieve a lot, in a short time, the easiest way possible.

As you trusted us when purchasing this book, we want to reward you with a FREE trial, where you will be able to use all the Reporting King features for absolutely FREE. And, as one of our readers, you will be able to get an **EXCLUSIVE EXTRA 20% OFF FOR THE FIRST 2 MONTHS** should you decide to pay for Reporting King after trying it for FREE.

The FREE trial has no obligations, you are welcome to continue using it or simply write us an email to give us feedback and help us improve the product. As you may have understood by now, our goal is to share our knowledge and experience so we can empower people solving problems when it comes to Excel and analytics. Videos, step-by-step guides and books are only a piece of the puzzle. We love to create real process automation through technology, and we want to share it with the world so anyone can analyse data and making beautiful presentations, no matter the skill level.

You can check the full Reporting King by scanning the QR code.

Reporting King is simple, easy to use, fast, and will save you countless hours of energy and stress.

Check out how this works.

Try Reporting King for FREE and take your charts to the next level

Get an Exclusive 20% OFF discount for READERS

For more information, visit our website at www.reportingking.com

Watch a 1-minute video tutorial, to see the REAL POWER OF AUTOMATION IN ACTION

**Reporting King
Video Tutorial**

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◆◆ Desktop App: app.reportingking.com

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Facebook: @reportingking

Instagram: @reportingkingapp

Tik Tok: @reportingking

LinkedIn: @reportingking

Twitter: @reporting_king

YouTube: @reportingking

Conclusion

Thank you for reading this book, I hope you enjoyed it and, most of all, I hope you learnt a lot of new things! What I wanted to transmit you was not only formulas and functions and how-to, but also process, lateral thinking, creativity, problem solving.

I encourage to keep studying, keep upgrading your knowledge and use Excel to consolidate the learnings.

Whatever stage of your life and career you are at, define your goals (personal, professional), understand how Excel can help you reach them, and deepen your Excel knowledge specifically in that niche.

(What does this job entail? What do I know about Excel to be successful at this?)

Whether you want to use it for personal reason, work remotely and monetize your skills, or boost your job prospects, you have already finished an intensive manual with you tools, tricks, functions, tutorials, workarounds, shortcuts, hacks... and you are already ahead in the game!

The world if full of opportunities and Excel can definitely provide some for you, as it's already doing for hundreds of people all over the world.

I wish you luck, success, and continuous learning.

Remember: you didn't get this far, only to get this far. The sky is the limit!