**DATA SCIENCE**

1. **TOOLS FOR DATA SCIENCE**

**A.1. EXCEL**

1. **BASIC**
2. Excel is the world's most used spreadsheet program.
3. It is a powerful tool to use for mathematical functions.
4. Excel is pronounced "Eks - sel"
5. It is a spreadsheet program developed by Microsoft. Excel organizes data in columns and rows and allows you to do mathematical functions. It runs on Windows, macOS, Android and iOS.
6. The first version was released in 1985 and has gone through several changes over the years. However, the main functionality mostly remains the same.
7. Excel is typically used for: Analysis, Data entry,Data management, Accounting, Budgeting, Data analysis, Visuals and graphs, Programming, Financial modeling And much, much more!

**2. WHY USE EXCEL?**

1. It is the most popular spreadsheet program in the world.
2. It is easy to learn and to get started.
3. The skill ceiling is high, which means that you can do more advanced things as you become better.
4. It can be used with both work and in everyday life, such as to create a family budget.
5. It has a huge community support
6. It is continuously supported by Microsoft
7. Templates and frameworks can be reused by yourself and others, lowering creation costs.

**3. RIBBON**

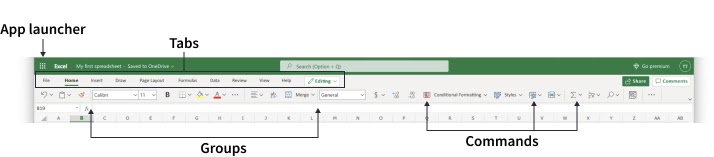
The Ribbon is made up by the App launcher, Tabs, Groups and Commands.

### **App launcher -** It allows you to access the different parts of the Office 365 suite, such as Word, PowerPoint and Outlook.

**Tabs -**  The tab is a menu with sub divisions sorted into groups. The tabs allow users to quickly navigate between options of menus which display different groups of functionality.

### **Groups -** The groups are sets of related commands. The groups are separated by the thin vertical line break.

**Commands -** The commands are the buttons that you use to do actions.



**4. Sheet**

1. The Sheet is a set of rows and columns. It forms the same pattern as we have in math exercise books, the rectangle boxes formed by the pattern are called cells.
2. Values can be typed to cells. Values can be both numbers and letters.
3. You start with one Sheet by default when you create a new workbook. You can have many sheets in a workbook. New sheets can be added and removed. Sheets can be named to making it easier to work with data sets.
4. The hotkey Shift + F11 to create new sheets. Or simply click on Add sign.
5. You can rename, copy, delete, protect, view code, select all, group, hide-unhide by write click on sheets.

**5. Syntax**

A formula in Excel is used to do mathematical calculations. Formulas always start with the equal sign = typed in the cell, followed by your calculation.

### Creating formulas, step by step

* Select a cell
* Type the equal sign (=)
* Select a cell or type value
* Enter an arithmetic operator
* Select another cell or type value
* Press enter

# **Range**

Range is an important part of Excel because it allows you to work with selections of cells.

There are four different operations for selection;

* Selecting a cell
* Selecting multiple cells - ctrl
* Selecting a column - by clicking a
* Selecting a row - by clicking 1
* Selecting the Entire - Sheet ctrl+a

The Name Box shows you the reference of which cell or range you have selected. It can also be used to select cells or ranges by typing their values.

## **Filling**

Filling makes your life easier and is used to fill ranges with values, so that you do not have to type manual entries.

Filling can be used for:

* Copying
* Sequences
* Dates
* Functions (\*)

## **How To Fill**

Filling is done by selecting a cell, clicking the fill icon and selecting the range using drag and mark while holding the left mouse button down.

The fill icon is found in the button right corner of the cell and has the icon of a small square. Once you hover over it your mouse pointer will change its icon to a thin cross.

## **Fill Copies**

Filling can be used for copying. It can be used for both numbers and words.

## **Double Click to Fill**

The fill function can be double clicked to complete formulas in a range:

## **Cells**

**Moving cells -**

There are two ways to move cells: Drag and drop or by copy and paste and cut paste, delete

**Drag and drop -** Select all cells when (+ with arrow) is coming move mouse.

## **Cut and Paste -** Select desired cells - Cut and paste.

**Copy and paste -** Select desired cells - Copy and paste.

**Delete -** Select the original cells and remove them by pressing the "Delete" button.

# **Excel Add Cells -** Adding New Columns - Adding New Rows - by clicking on insert.

## **Delete Cells -** Cells can be deleted by selecting them, and pressing the delete button.

1. **Undo and Redo -**

## **Undo (CTRL + Z ) -** The Undo function lets you reverse an action. Undo is helpful if you regret an action and want to go back to how it was before.

* Undo deleting a formula
* Undo adding a column
* Undo removing a row

## **Redo ( CTRL +Z) -** The Redo function has the opposite effect as Undo, it reverses the Undo action. Redo is helpful if you regret using Undo.

There are two ways to access the Redo command.

# **Excel References -**

**Relative References -** Are relative by default, and are without dollar sign ($). Every formula is having references.

## **Absolute References -** Absolute reference is when a reference has the dollar sign ($).

# **Excel Arithmetic Operator -**

# **1. Addition operator -**

I) adding 2 cells (= a1 + b1)

II) adding 2 values. (=5+5)

III) adding several cels = (= a1 + b1 + C1 +d1 + e1)

Iv) adding Several cells = (= sum mark a range A1:A5)

V) addition of absolute references

# **2. Excel Subtraction Operator**

# Same as Addition only a formula like sum formula is not available for subscription.

**3. Excel Multiplication Operator**

Same as Substruction but multiplying 2 cells only available. Several cells not available.

4. **Excel Division Operator -** same as multiplication.

**12. Parentheses -**

Parentheses () is used to change the order of an operation.

Using parentheses makes Excel do the calculation for the numbers inside the parentheses first, before calculating the rest of the formula.

Parentheses are added by typing () on both sides of numbers, like (1+2).

No parentheses - =10+5\*2

The result is 20 because it calculates (10+10)

**With parentheses =(10+5)\*2**

**The result is 30 because it calculates (15)\*2**

**Formulas can have groups of parentheses.**

**=(10+5)+(2\*4)+(4/2)**

## Nesting Parentheses

Example no nesting =2\*2+3\*4+5\*5\*2

Example nesting = =((2\*2)+(3\*4)+(5\*5))\*2

**13. Excel Formatting -**

## **Formatting -** Excel has many ways to format and style a spreadsheet.

Why format and style your spreadsheet?

* Make it easier to read and understand
* Make it more delicate

Styling is about changing the looks of cells, such as changing colors, font, font sizes, borders, number formats, and so on.

The most used styling functions are:

* Colors
* Fonts
* Borders
* Number formats
* Grids

There are two ways to access the styling commands in Excel:

1. The Ribbon
2. Formatting menu, by right clicking cells

**Regional Format Settings.**

Excel provides regional formatting settings for different languages and styles of presenting information.

Regional settings affects a number of things, like:

* Calendar date formatting
* Decimal numbers
* Default currency formatting
* Formula delimiters

Formula delimiters are the symbols used to separate arguments in a function.

The most common symbols are comma , and semicolon ;

## **Grids -**

By default, gridlines are displayed in Excel.

However, grids can be removed.

Why remove grids?

* Make the spreadsheet more readable
* Make the spreadsheet more delicate

How to remove grids

1. Click view in the Ribbon navigation bar
2. Uncheck gridlines

## **Number Formats**

The default Number format is General.

Why change number formats?

* Make data explainable
* Prepare data for functions, so that Excel understands what kind of data you are working with.

Examples of number formats:

* General
* Number
* Currency
* Time

Number formats can be changed by clicking the Number format dropdown, accessed in the Ribbon, found in the Numbers group.

## **Decimals**

The number of decimals can be increased and decreased.

There are two commands:

* Increase Decimal
* Decrease Decimal

Clicking them reduces or increases the number of decimals.

The commands can be found next to the Number format dropdown menu.

## **Other formats -** Format Borders, Format Fonts, Format Colors.

14. FUNCTIONS : -

1. 30 MAIN FUNCTIONS

## AND Function - The AND function is a premade function in Excel, which returns TRUE or FALSE based on two or more conditions.