What is Excel?

- Excel is pronounced "Eks - sel"
- 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.
- The first version was released in 1985 and has gone through several changes over the years. However, the main functionality mostly remains the same.

Application of Excel

- Analysis
- Data entry
- Data management
- Accounting
- Budgeting
- Data analysis
- Visuals and graphs
- Programming
- Financial modeling
- And much, much more!

Why Use Excel?

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

Data Types

Types	Example
Integer	1,25,1,-1,-5
Float	1.2, 2.363574, -2.3654
Character	“A”, “1”
String	“A quick brown fox jumps over the lazy dog.”
Currency	$5,857.00
Date	11/13/2023
Boolean	True/False

Selection

- Single Cell Select
- Multiple Cell Select
- Range Select
- Column/Row Select

What is Cell In Excel

Cells are the boxes you see in the grid of an Excel worksheet, like this one. Each cell is identified on a worksheet by its reference, the column letter and row number that intersect at the cell's location.

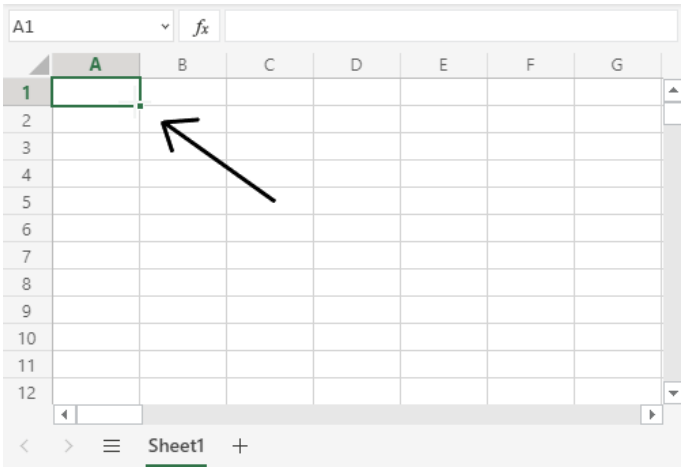
Cell contains:

→ **Selection Point**
→ **Move Tool**
→ **Data Writing**
→ **Data Filling**
→ **Cell Location/Reference**
→ **Function Mode**

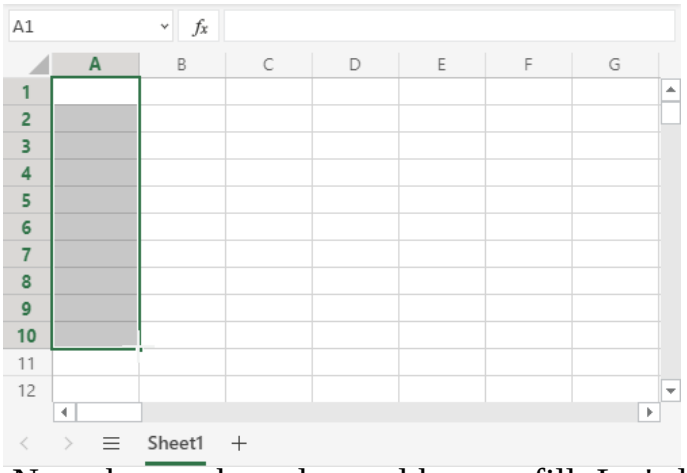
Excel Data Filling

- **Copy**
- **Sequence**
- **Date**
- **Function (*)**

How To Fill?



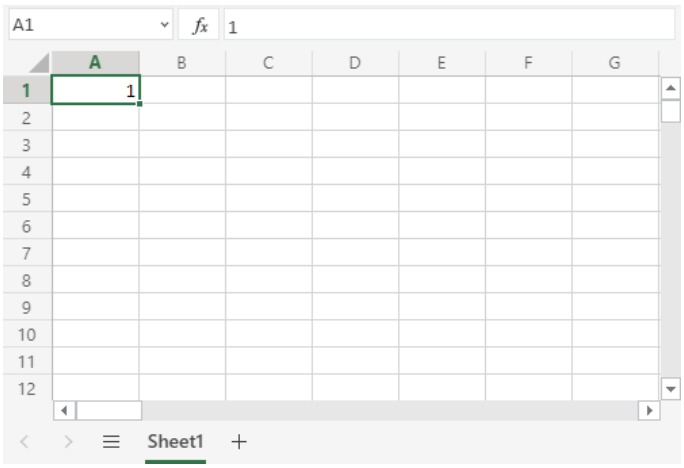
Click the fill icon and hold down the left mouse button, drag and mark the range that you want to cover.
In this example, cell A1 was selected and the range A1:A10 was marked.



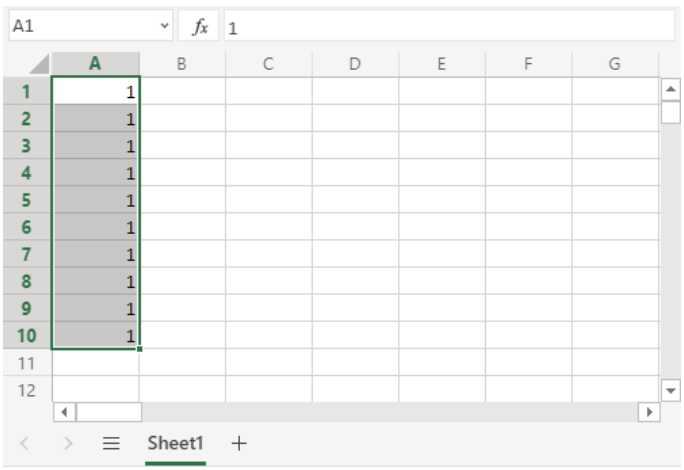
Now that we have learned how to fill. Let's look into how to copy with the fill function.

Excel Data Filling - Copy

Fill Copies
Filling can be used for copying. It can be used for both numbers and words.
Let's have a look at numbers first.
In this example we have typed the value A1(1):



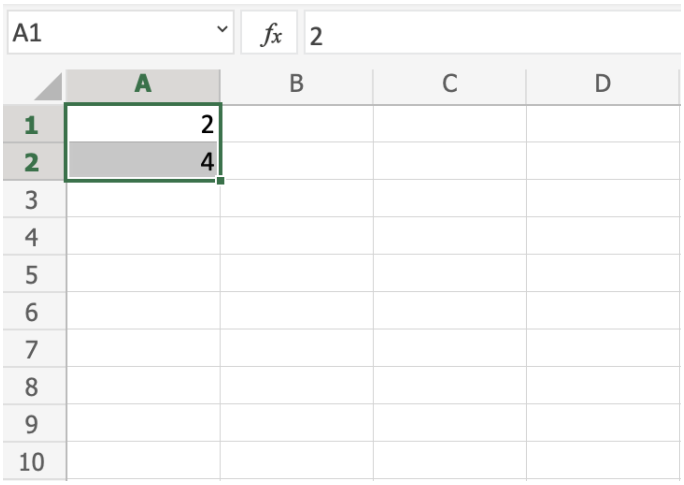
Filling the range A1:A10 creates ten copies of 1:



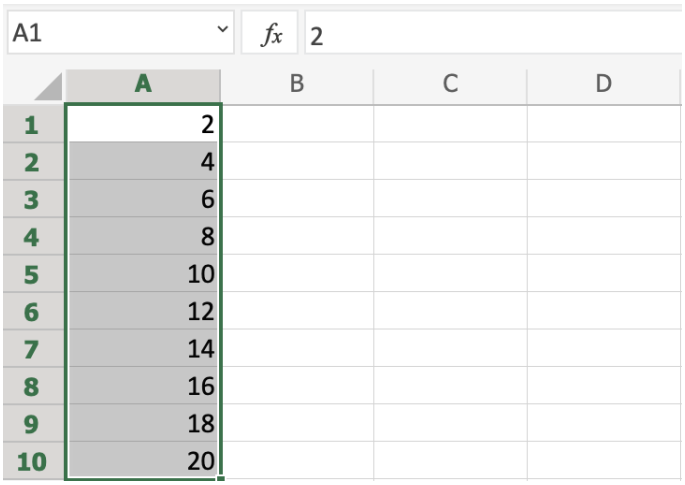
The same principle goes for text.

Excel Data Filling - Sequence

Filling can be used to create sequences. A sequence is an order or a pattern. We can use the filling function to continue the order that has been set.
Sequences can for example be used on numbers and dates.
Let's start with learning how to count even number.
This is different from the last example because this time we do not want to copy, but to count from 1 to 10.
Start with typing A1(2) and A2(4):



Now, fill A1:A10:



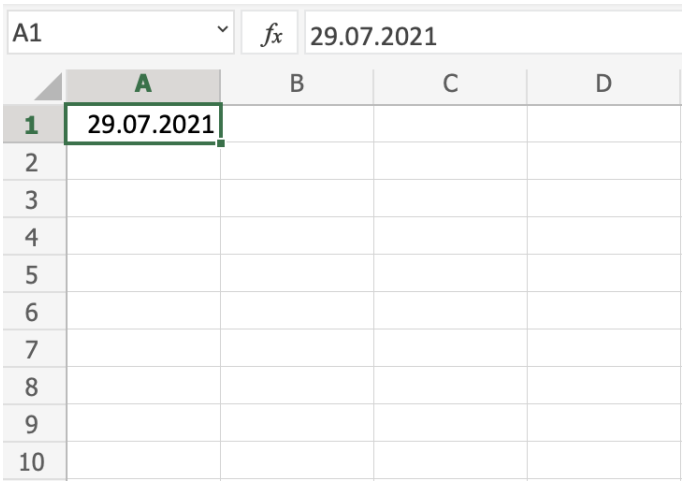
It counts from 2 to 20 in the range A1:A10.
This is because we created an order with A1(2) and A2(4).
Then it fills the next cells, A3(6), A4(8), A5(10) and so on. The fill function understands the pattern and helps us continue it.

Excel Data Filling - Date

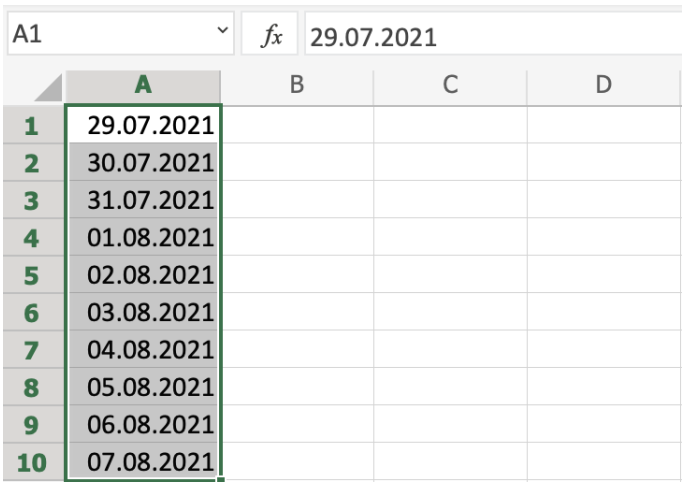
The fill function can also be used to fill dates.

[Note: The date format depends on you regional language settings.
For example 14.03.2023 vs. 3/14/2023]

Test it by typing A1(29.07.2021):



And fill the range A1:A10:



The fill function has filled 10 days from A1(29.07.2021) to A10(07.08.2021).

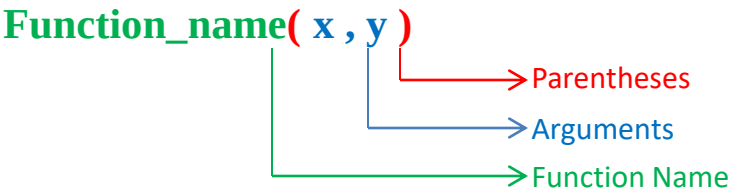
Note that it switched from July to August in cell A4. It knows the calendar and will count real dates.

Excel Data Filling – Function*

Before we go into function filling, we need to understand what a function is and how it works.

Function in Excel

Functions are predefined formulas that perform calculations by using specific values, called arguments, in a particular order, or structure. Functions can be used to perform simple or complex calculations.



How to write a function/Formula in excel:

- Type = sign
- **If you use built-in function then type function name with parentheses.**
- Enter a value
- Type an arithmetic sign -> +, - , x , /
- Enter Value and Hit Enter

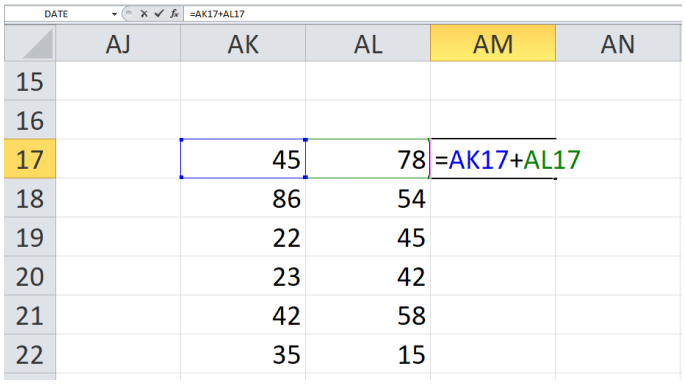
What is Nested Function?
Nested functions are those in which one function contains another.

Brackets

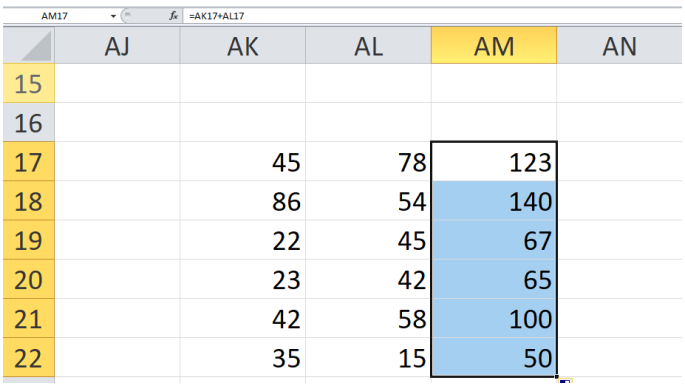
Name	Sign
Parentheses	( )
Curly Bracket	{ }
Square Bracket	[ ]

Excel Data Filling – Function

Let's construct a function that calculates the sum of two numbers given in AK(17) and AL(17), and displays the result in AM(17).



Now, fill AM(17):AM(22):



The results are displayed here in accordance with the function procedure, which is achieved by function filling.

Cell Reference/Location

- Relative
- Absolute

Relative:
Relative location/reference occurs when a cell's location changes while data is being filled.

Absolute:
Absolute location/reference occurs when a cell's position remains constant during data filling.

Built-in Functions in Excel

Function Name	Description
Sum(Data Range)	Adds together numbers in a range
Product(Data Range)	
Max(Data Range)	Returns the highest value in a range
Min(Data Range)	Returns the lowest value in a range
Average(Data Range)]	Calculates the average (arithmetic mean)
Averageif(All Category, Specific Category, All Value)	Calculates the average of a range based on a TRUE or FALSE condition
Averageifs(All Value, All Category 1, Specific Category 1, All Category 2, Specific Category 2, ...)	Calculates the average of a range based on one or more TRUE/FALSE conditions
And(Conditional Statement)	Returns TRUE or FALSE based on two or more conditions
Count(Data Range)	Counts cells with numbers in a range

Built-in Functions in Excel - Continue

Function Name	Description
Countblank(Data Range)	Counts blank cells in a range
Counta(Data Range)	Counts all cells in a range that has values, both numbers and letters
Concatenate(Cell Location 1, Cell Location 2, ...)	Links together the content of multiple cells
left(Cell Location, Number of Character)	Returns values from the left side of a cell
Right(Cell Location, Number of Character)	Returns values from the right side of a cell
Randbetween(lower limit, Upper Limit)	The function will return a random integer number between the user-specified numbers. It will return a random integer number every time the worksheet is opened or calculated.
Rand()	Generates a random number
Trim(cell)	Removes irregular spacing, leaving one space between each value
if(Condition ,True ,False)	Returns values based on a TRUE or FALSE condition
Vlookup(input,table data range,output,0)	Allows vertical searches for values in a table

Excel Table

Ranges can be converted into tables.
Tables make it easier to structure and organize data.
Tables connect cells in a range and put it into a fixed structure.
The cells in the table range share the same formatting.
[Note: Tables can be used to prepare data for charts and pivot tables.]

Tables allow for options such as:

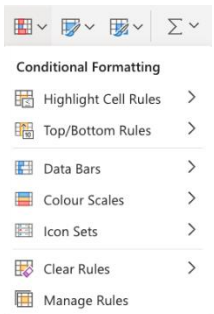
- Sort & Filter
- Formatting
- AutoFilling

Table Work:

- Create Table
- Resize
- Remove duplicates
- Convert to range
- Table Name
- Table Desing
- Style options (Total row, Header row, Banded row etc..)
- Formatting

Excel Conditional Formatting

Conditional formatting is used to change the appearance of cells in a range based on your specified conditions.
The conditions are rules based on specified numerical values or matching text.
Changing the appearance of cells can visually highlight interesting data points for analysis.
The browser version of Excel provides a number of built-in conditions and appearances:



Excel PivotTable

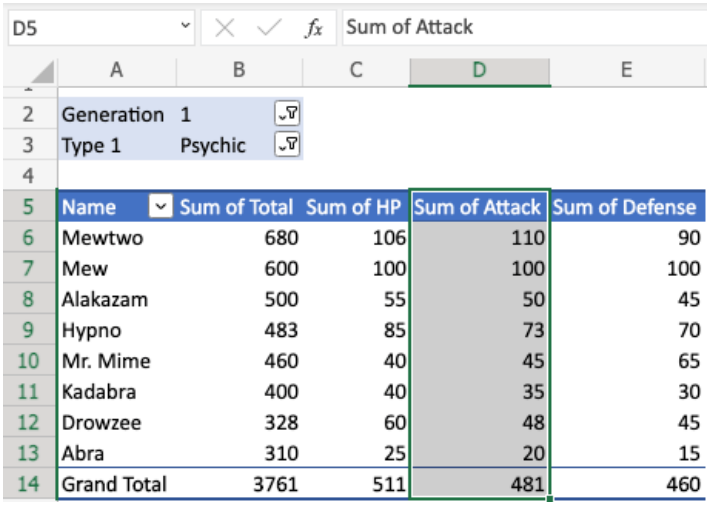
PivotTable is a functionality in Excel which helps you organize and analyze data.
It lets you add and remove values, perform calculations, and to filter and sort data sets.
PivotTable helps you structure and organize data to understand large data sets.

How a PivotTable Works

PivotTables have four main components:

1) Columns

Columns are vertical tabular data.
The column includes the unique header, which is on the top.
The header defines which data you are seeing listed downwards.
In this example, D5(Sum of Attack) is the header.
D6(110), D7(100), D8(50), D9(73), and so on are the data.



	A	B	C	D	E
2	Generation	1			
3	Type 1	Psychic			
4					
5	Name	Sum of Total	Sum of HP	Sum of Attack	Sum of Defense
6	Mewtwo	680	106	110	90
7	Mew	600	100	100	100
8	Alakazam	500	55	50	45
9	Hypno	483	85	73	70
10	Mr. Mime	460	40	45	65
11	Kadabra	400	40	35	30
12	Drowzee	328	60	48	45
13	Abra	310	25	20	15
14	Grand Total	3761	511	481	460

How a PivotTable Works - Continue

2) Rows

Rows are horizontal tabular data.
Data in the same row are related.
In this example, A8(Alakazam) is the Pokemon name.
B8(500), C8(55), D8(50), E8(45) represents the pokemons stats.
The type of stats is read in the header in the columns.

A8

	A	B	C	D	E
2	Generation	1			
3	Type 1	Psychic			
4					
5	Name	Sum of Total	Sum of HP	Sum of Attack	Sum of Defense
6	Mewtwo	680	106	110	90
7	Mew	600	100	100	100
8	Alakazam	500	55	50	45
9	Hypno	483	85	73	70
10	Mr. Mime	460	40	45	65
11	Kadabra	400	40	35	30
12	Drowzee	328	60	48	45
13	Abra	310	25	20	15
14	Grand Total	3761	511	481	460

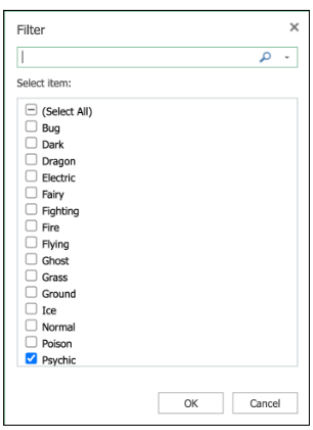
3) Filters

Filters are used to select what data you see.
In this example, there are two filters enabled: Generation and Type 1.
The filters are set to Generation (1) and Type (Psychic).
We will only see Generation 1 pokemon that is Type 1, Psychic.
All pokemon in the table below the filter are of this generation and type.

A2 Generation

	A	B	C	D	E
2	Generation	1			
3	Type 1	Psychic			
4					
5	Name	Sum of Total	Sum of HP	Sum of Attack	Sum of Defense
6	Mewtwo	680	106	110	90
7	Mew	600	100	100	100
8	Alakazam	500	55	50	45
9	Hypno	483	85	73	70
10	Mr. Mime	460	40	45	65
11	Kadabra	400	40	35	30
12	Drowzee	328	60	48	45
13	Abra	310	25	20	15
14	Grand Total	3761	511	481	460

Filter view:



How a PivotTable Works - Continue

4) Values

Values define how you present the data.
You can define how you Summarize and Show values.
In this example, values are defined for the range B5:E5.
The range B5:E5 has all the same value setting: Sum
The Sum is summarized in the range B14:E14.

E5 | Sum of Defense

	A	B	C	D	E
2	Generation	1			
3	Type 1	Psychic			
4					
5	Name	Sum of Total	Sum of HP	Sum of Attack	Sum of Defense
6	Mewtwo	680	106	110	90
7	Mew	600	100	100	100
8	Alakazam	500	55	50	45
9	Hypno	483	85	73	70
10	Mr. Mime	460	40	45	65
11	Kadabra	400	40	35	30
12	Drowzee	328	60	48	45
13	Abra	310	25	20	15
14	Grand Total	3761	511	481	460

Values settings view:
You can change the name and settings of the values.