

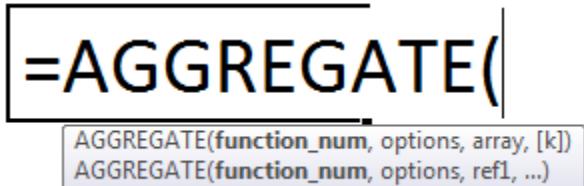
## Program 1

**Aim:** Getting Started with Excel: Creation of spread sheets, Insertion of rows and columns, Drag & Fill, use of Aggregate functions.

### 1. AGGREGATE function:

The **AGGREGATE function** of Excel returns the aggregate of a given data table or data list. The first argument is a function number, and the further arguments consist of a range of data sets. One must remember the function number to know which function to use.

## Syntax of the AGGREGATE Function



### Array Syntax

“=AGGREGATE (function\_num, options, array, [k])”

The following additional arguments are used in array syntax:

- **Array:** This is an array of values on which we want to operate.
- **K:** This is a numeric value used with functions like LARGE, SMALL, PERCENTILE.EXC, QUARTILE.INC, PERCENTILE.INC, and QUARTILE.EXC.

The “array” is a mandatory argument and “k” is an optional argument.

### Reference Syntax

“=AGGREGATE (function\_num, options, ref1, ref2, ref[3],... )”

The function accepts the following arguments:

**Function\_num:** This number represents a specific function that is to be used. It ranges from 1-19.

Function_num	Function
1	AVERAGE
2	COUNT
3	COUNTA
4	MAX
5	MIN
6	PRODUCT
7	STDEV.S
8	STDEV.P
9	SUM
10	VAR.S
11	VAR.P
12	MEDIAN
13	MODE.SNGL
14	LARGE
15	SMALL
16	PERCENTILE.INC
17	QUARTILE.INC
18	PERCENTILE.EXC
19	QUARTILE.EXC

**Options:** This is a numeric value ranging from 0 to 7. It determines the values that are ignored during calculations.

Option	Description
0 or omitted	Ignore nested SUBTOTAL and AGGREGATE functions
1	Ignore hidden rows, nested SUBTOTAL and AGGREGATE functions
2	Ignore error values, nested SUBTOTAL and AGGREGATE functions
3	Ignore hidden rows, error values, nested SUBTOTAL and AGGREGATE functions
4	Ignore nothing
5	Ignores the hidden rows
6	Ignore the error values
7	Ignore hidden rows and error values

**Ref1, ref2, ref[3]:** This is the numeric value or values on which computations are to be performed.

It is mandatory to provide at least two of these arguments, and the remaining arguments are optional.

## The Characteristics of the AGGREGATE Function

The features of the AGGREGATE function are listed as follows:

- It does not recognize the function\_num value greater than 19 and lesser than 1.
- For Option Number, the AGGREGATE function does not identify the values greater than 7 and lesser than 1.
- If we feed any other values, it gives a “**#VALUE! error.**”
- It always accepts a numeric value and always returns a numeric value as the output.
- It ignores only the hidden rows but does not ignore the hidden columns.

## 2. Creating/Inserting rows & columns/Entering data/Drag & Fill using Spreadsheets:

Create a suitable examination database and find the sum of the marks (total) of each Student Average, pass or fail and grade secured by each student.

### Rules:

- Pass if marks in each subject  $\geq 35$ ,
- Distinction if average  $\geq 70$ ,
- First class if average  $\geq 60$  but  $< 70$ ,
- Second class if average  $\geq 50$  but  $< 60$ ,
- Third class if average  $\geq 35$  and  $< 50$ ,
- Fail if marks in any subject is  $< 35$ .

Display average marks of the class, subject wise and pass percentage.

### Solution:

To find the grade of a student we need to do the following steps

#### Step1: Typing Student database in Excel

Type the student database with the required fields starts from A1 cell as follows:

	A	B	C	D	E	F	G	H	I	J	K	L
1	SL. No.	Name of the Student	ADE	OOPS	DSA	DDCO	MATHS	OS	TOTAL	AVERAGE	P/F	GRADE
2	1	REKHA	90	98	97	90	90	98				
3	2	RASHMI	97	90	97	98	97	97				
4	3	LAKSHMI	98	98	90	97	90	90				
5	4	RADHA	99	90	99	98	97	98				
6	5	PUSHPA	90	99	90	99	90	99				

## Step2: To Find Total Marks of Student

To find the total marks of a student click on the cell “I2” and type the following formula:

=SUM (C2:H2)

To find the total marks for the remaining students select “I2” cell and drag down to the remaining students.

	A	B	C	D	E	F	G	H	I
1	SL. No.	Name of the Student	ADE	OOPS	DSA	DDCO	MATHS	OS	TOTAL
2	1	REKHA	90	98	97	90	90	98	563
3	2	RASHMI	97	90	97	98	97	97	576
4	3	LAKSHMI	98	98	90	97	90	90	563
5	4	RADHA	99	90	99	98	97	98	581
6	5	PUSHPA	90	99	90	99	90	99	567

## Step 3: To find Average marks

To find the average marks of the student click on the cell “J2” and type the following formula

=I2/600\*100

To find the average marks for the remaining students select “J2” cell and drag down to all the students.

	A	B	C	D	E	F	G	H	I	J
1	SL. No.	Name of the Student	ADE	OOPS	DSA	DDCO	MATHS	OS	TOTAL	AVERAGE
2	1	REKHA	90	98	97	90	90	98	563	93.8
3	2	RASHMI	97	90	97	98	97	97	576	96.0
4	3	LAKSHMI	98	98	90	97	90	90	563	93.8
5	4	RADHA	99	90	99	98	97	98	581	96.8
6	5	PUSHPA	90	99	90	99	90	99	567	94.5

## Step4: To Check Pass or Fail

To check whether the student is Pass or Fail select the cell “K2” and type the following formula.

=IF(AND(C2>=35,D2>=35,E2>=35,F2>=35,G2>=35,H2>=35),"Pass","Fail")

To check the remaining students are Pass/Fail selects the cell “K2” and drag down to all the students

	A	B	C	D	E	F	G	H	I	J	K
1	SL. No.	Name of the Student	ADE	OOPS	DSA	DDCO	MATHS	OS	TOTAL	AVERAGE	P/F
2	1	REKHA	90	98	97	90	90	98	563	93.8	Pass
3	2	RASHMI	97	90	97	98	97	97	576	96.0	Pass
4	3	LAKSHMI	98	98	90	97	90	90	563	93.8	Pass
5	4	RADHA	99	90	99	98	97	98	581	96.8	Pass
6	5	PUSHPA	90	99	90	99	90	99	567	94.5	Pass

## Step5: To find Grade

To find the grade of a student click on the cell “L2” and type the following formula

```
=IF(AND(C2>=35,D2>=35,E2>=35,F2>=35,G2>=35,H2>=35),IF(J2>=75,"Distinction",IF(J2>=65,"First Class",IF(J2>=50,"Second Class",IF(J2>=35,"Third Class"))),"Fail")
```

To find the grade for the remaining students select “L2” cell and drag down to the all the students

	A	B	C	D	E	F	G	H	I	J	K	L
1	SL. No.	Name of the Student	ADE	OOPS	DSA	DDCO	MATHS	OS	TOTAL	AVERAGE	P/F	GRADE
2	1	REKHA	90	98	97	90	90	98	563	93.8	Pass	Distinction
3	2	RASHMI	97	30	97	98	97	97	516	86.0	Fail	FAIL
4	3	LAKSHMI	98	98	90	97	90	90	563	93.8	Pass	Distinction
5	4	RADHA	66	55	66	66	77	44	374	62.3	Pass	Second Classs
6	5	PUSHPA	66	55	66	66	77	99	429	71.5	Pass	First Class

## RESULT:

Student database with total, average and grade

SL. No.	Name of the Student	ADE	OOPS	DSA	DDCO	MATHS	OS	TOTAL	AVERAGE	P/F	GRADE
1	REKHA	90	98	97	90	90	98	563	93.8	Pass	Distinction
2	RASHMI	97	30	97	98	97	97	516	86.0	Fail	FAIL
3	LAKSHMI	98	98	90	97	90	90	563	93.8	Pass	Distinction
4	RADHA	66	55	66	66	77	44	374	62.3	Pass	Second Classs
5	PUSHPA	66	55	66	66	77	99	429	71.5	Pass	First Class

## Program 2

### **Aim: Working with Data: Importing data, Data Entry & Manipulation, Sorting & Filtering.**

Microsoft Excel offers various features for importing data, entering information, manipulating content, sorting, and filtering.

#### **1. Importing Data:**

Excel allows you to import data from various sources, making it a versatile tool for handling diverse datasets.

##### **Open Excel and Navigate to Data Import**

###### **Step-1: Opening Excel:**

- Start by launching Microsoft Excel on your computer.

###### **Step-2: Access Data Import:**

- Click on the "File" tab in the ribbon at the top of Excel.
- Select "Open" from the menu to open a previously saved file. Alternatively, choose "Get External Data" or "Import" based on your Excel version and select the source of data (e.g., CSV, Database, Web)

###### **Step-3: Import Data:**

- If you choose "From Text/CSV," navigate to the location of your CSV file and click "Import."
- Excel will guide you through the import process, allowing you to specify delimiters, data types, and other settings.

#### **2. Data Entry and Basic Manipulation**

Excel provides a user-friendly interface for entering data and performing basic manipulations.

###### **Step-1: Entering Data:**

- Click on a cell and start typing your data. Press Enter to move to the cell below or use the arrow keys to navigate.
- Excel automatically adjusts the width of the cell to fit your data.

###### **Step-2: Data Manipulation:**

###### **• Copying and Pasting:**

- Select a range of cells, right-click, and choose "Copy."
- Move to the destination, right-click, and choose "Paste" to copy the data.

###### **• Formulae and Functions:**

- Enter formulas in cells to perform calculations.

For example, =SUM(A2:A10) calculates the sum of cells A2 to A10.

- Excel offers a wide range of functions (AVERAGE(), IF(), VLOOKUP(), etc.) for advanced calculations.

- **Data Validation:**

- Select a range, go to the "Data" tab, and click on "Data Validation."
- Set criteria to restrict data entry, such as allowing only numbers between a specific range.

### 3. Sorting Data

Sorting data helps in organizing information in a meaningful way for better analysis.

- **Sorting Ascending/Descending: Select the column you want to sort:**

- Click on the "Data" tab and choose "Sort A to Z" for ascending or "Sort Z to A" for descending order.
- Alternatively, right-click the selected column and choose "Sort."

- **Complex Sorting:**

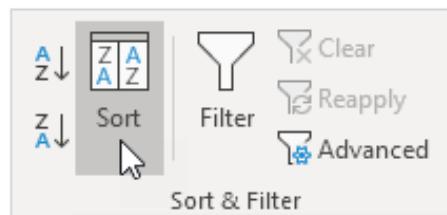
- For sorting based on multiple criteria (e.g., first sort by Category, then by Price within each Category), use the "Sort" dialog box.
- Specify the primary and secondary sort columns along with the sort order for each.

- **To Sort the Data:**

- Select data on list to be sorted.

	A	B	C	D	E	F
1	USN	First Name	Last Name	Occupation	Address	DOB
2	1	Narayana	Murthy	Founder	Karnataka	20-Aug-46
3	2	Abdul	Kalam	President	Rameswaram	15-Oct-31
4	3	Mahendra Singh	Dhone	Cricketer	Ranchi	07-Jul-81
5	4	Sundar	Pichai	CEO	Madurai	10-Jun-72

- Click the Data Menu and select the sort option. The sort dialog box appears.

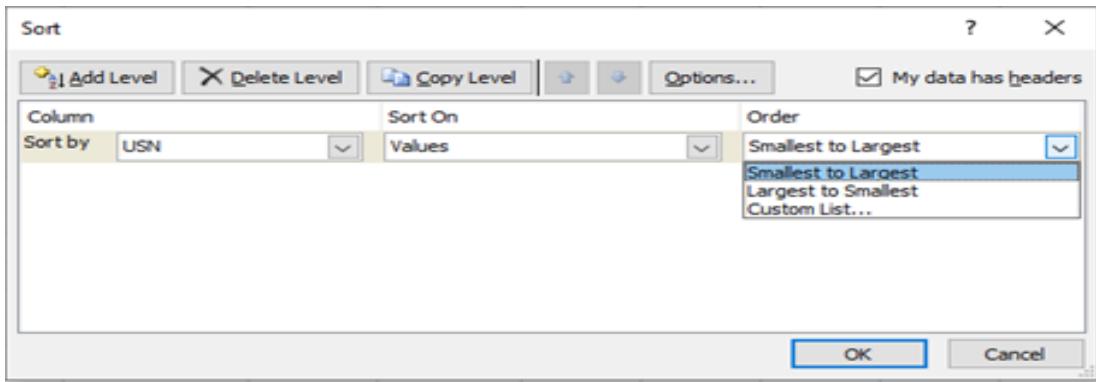


The Sort dialog box appears.

- Data sorted by selecting the ascending and descending option by selecting First Name column.

	A	B	C	D	E	F
1	USN	First Name	Last Name	Occupation	Address	DOB
2	2	Abdul	Kalam	President	Rameswaram	15-Oct-31
3	3	Mahendra Singh	Dhone	Cricketer	Ranchi	07-Jul-81
4	1	Narayana	Murthy	Founder	Karnataka	20-Aug-46
5	4	Sundar	Pichai	CEO	Madurai	10-Jun-72

- Numbers can be sorted as follows:



## 4. Filtering Data

Filtering data allows you to focus on specific subsets of information within your dataset.

### Step-1: Applying Filters:

- Select your data range.
- Click on the "Data" tab and select "Filter."
- Dropdown arrows will appear next to each column header.
- Click on these arrows to filter data based on specific criteria.

	A	B	C	D	E	F
1	USN	First Name	Last Name	Occupation	Address	DOB
2	1	Narayana	Murthy	Founder	Karnataka	20-Aug-46
3	2	Abdul	Kalam	President	Rameswaram	15-Oct-31
4	3	Mahendra Singh	Dhone	Cricketer	Ranchi	07-Jul-81
5	4	Sundar	Pichai	CEO	Madurai	10-Jun-72

### Step-2: Filtering Criteria:

- For text columns, you can filter by specific text values.
- For numeric columns, you can filter by numbers greater than, less than, or within a specific range.
- For date columns, filter options include dates within a specific period.

	A	B	C	D	E	F
1	USN	First Name	Last Name	Occupation	Address	DOB
2	1	Narayana	Murthy	Founder	Karnataka	20-Aug-46

Select only Karnataka field by applying filter

**RESULT:**

Sorting and Filtering applied to the dataset.

	A	B	C	D	E	F
1	USN	First Name	Last Name	Occupation	Address	DOB
2	1	Narayana	Murthy	Founder	Karnataka	20-Aug-46
3	2	Abdul	Kalam	President	Rameswaram	15-Oct-31
4	3	Mahendra Singh	Dhone	Cricketer	Ranchi	07-Jul-81
5	4	Sundar	Pichai	CEO	Madurai	10-Jun-72

## Program 3

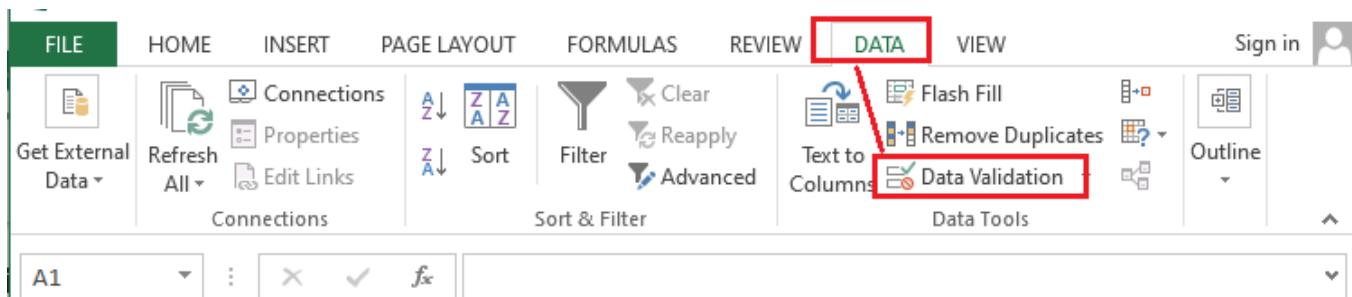
**Aim: Working with Data: Data Validation, Pivot Tables & Pivot Charts.**

### Data Validation:

Data validation is a feature in Excel which is used to control what users can enter into a cell. It allows you to dictate specific rules. It also allows users to display a custom message if users try to enter invalid data. Data validation in Excel is a technique that restricts user input in a worksheet. It is often used to limit user entry.

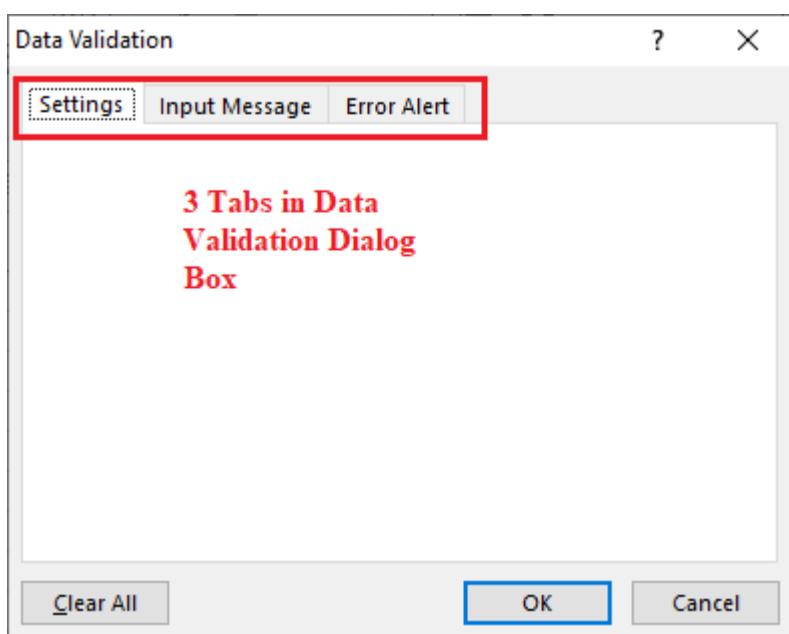
#### 1. Data Validation Controls:

The Data Validation feature or its controls can be found on the ribbon under the Data tab. By default, it is placed under the category 'Data Tools'.



#### 2. Using Data Validation Dialog Box to Define Validation Rules:

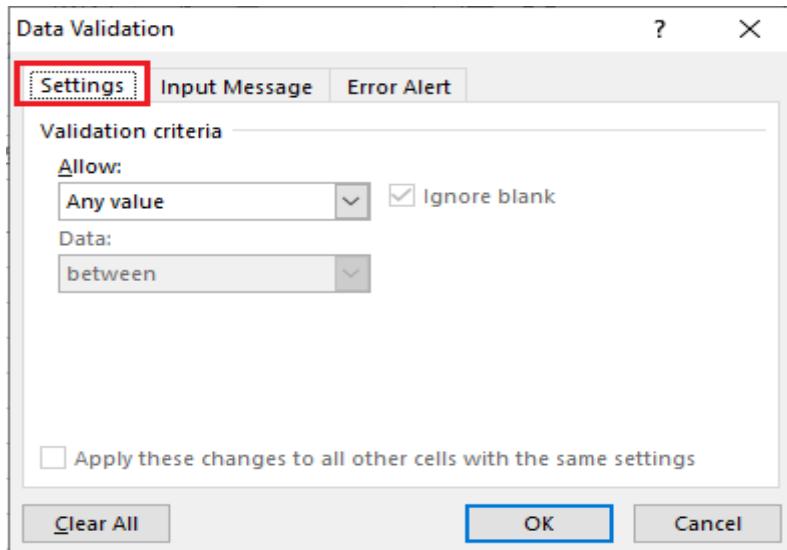
The Data Validation dialogue box contains three essential options/ tabs: **Settings**, **Input Message**, and **Error Alert**.



Let us understand each tab in detail:

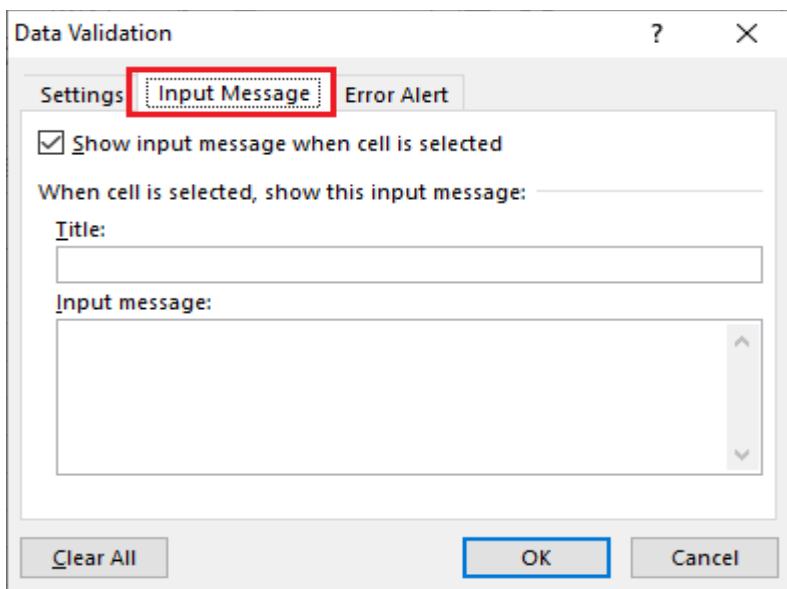
### Settings Tab

The settings tab provides us options to set validation criteria. The tab helps us choose the desired validation rules from the built-in options we want to allow in selected cells. Moreover, we can also set custom rules with the customized formula to validate user inputs. The settings tab contains all the **data validation options** present in Excel.



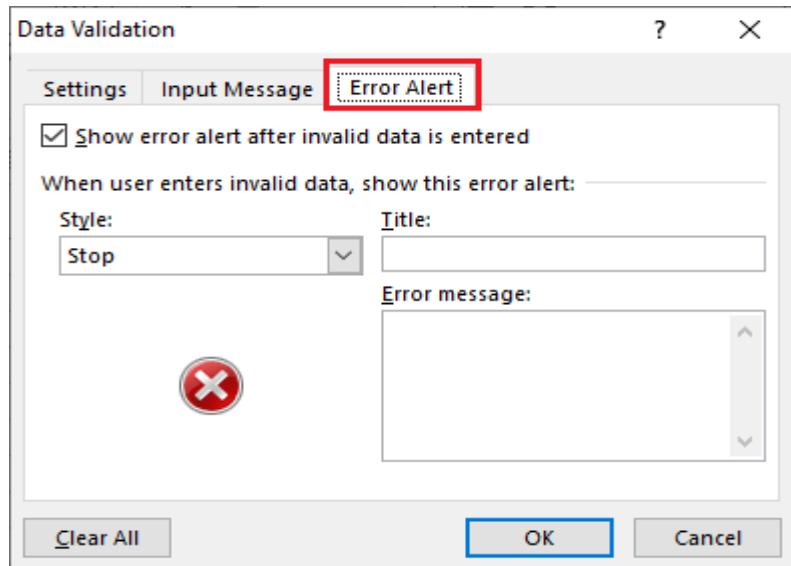
### Input Message Tab

The input message tab has a text box to enter a message displayed as soon as the respective cell is selected. The input message is an optional feature of Data Validation. If we do not define any message as an input message, excel does not show any message when the user selects the respective cell with data validation. It does not affect the working of the data validation and has no effect or control over what the user enters into a cell. However, it can be helpful to inform users about the allowed or expected data values.



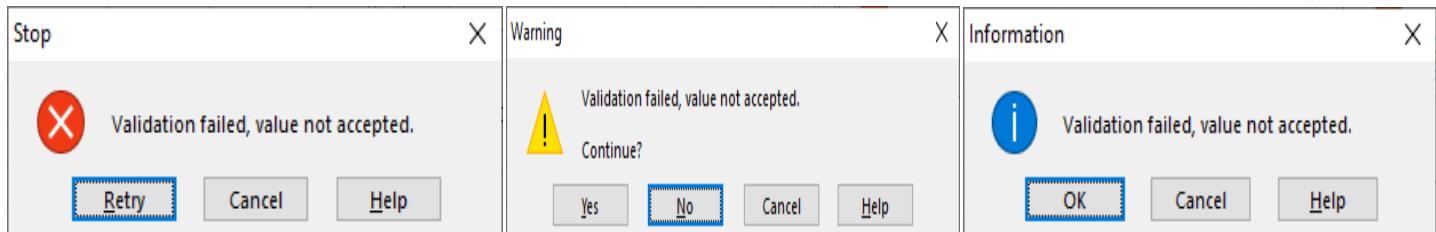
## Error Alert Tab

The error alert tab provides us options to control the way how the validation is enforced. We can set criteria and then use any desired error style to accept or reject the user inputs accordingly. Additionally, we can also display a message to the user informing what the error is or what values must be entered in corresponding cells.



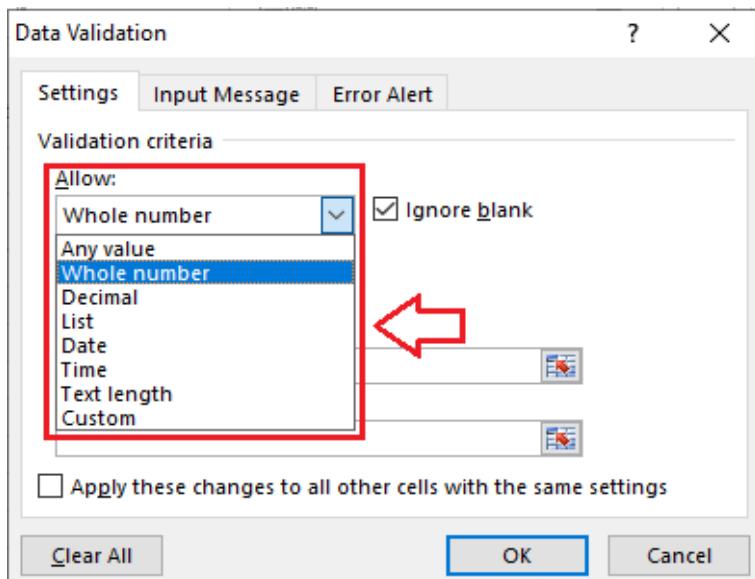
There are currently three types of error styles in MS Excel, as listed below:

Icon	Type	Use to
	Stop	Prevent users from entering invalid data in a cell.  A Stop alert message has two options: <b>Retry</b> or <b>Cancel</b> .
	Warning	Warn users that the data they entered is invalid, without preventing them from entering it.  When a Warning alert message appears, users can click <b>Yes</b> to accept the invalid entry, <b>No</b> to edit the invalid entry, or <b>Cancel</b> to remove the invalid entry.
	Information	Inform users that the data they entered is invalid, without preventing them from entering it. This type of error alert is the most flexible.  When an Information alert message appears, users can click <b>OK</b> to accept the invalid value or <b>Cancel</b> to reject it.



### 3. Data Validation Options

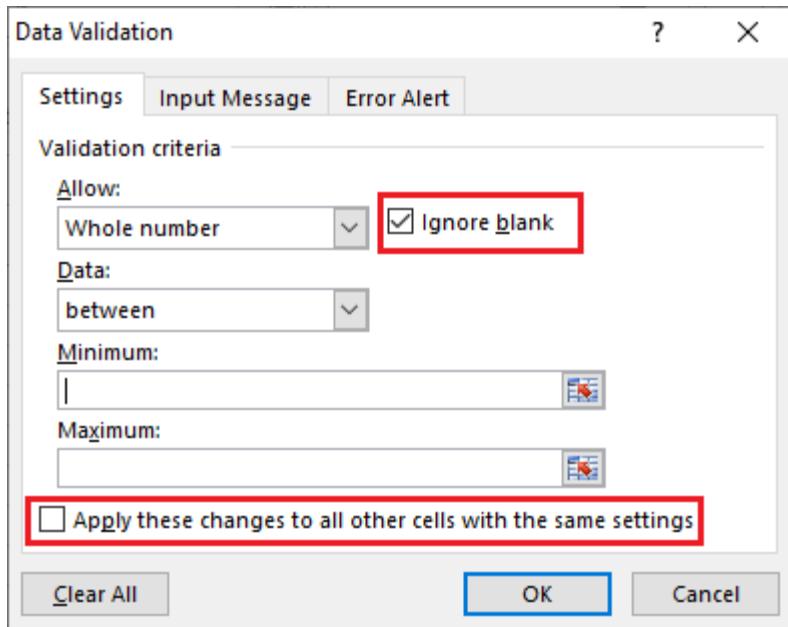
When creating a data validation rule from the settings tab, we have eight options to validate user inputs. They are as follows:



- **Any Value** - It removes restrictions and allows every value in selected cells, making no validation at all.
- **Whole Number** - to restrict the cell to accept only whole numbers.
- **Decimal** - to restrict the cell to accept only decimal numbers.
- **List** - to pick data from the drop-down list.
- **Date** - to restrict the cell to accept only date.
- **Time** - to restrict the cell to accept only time.
- **Text Length** - to restrict the length of the text.
- **Custom** – for custom formula.

Apart from the validation options, the settings tab also displays two checkboxes:

- **Ignore Blank:** If this option is marked, it instructs Excel not to validate empty/ blank cells. In technical terms, this option mainly affects the command 'circle invalid data'. When selected as marked, the cells with no values are not circled even if they fail to pass validation.
- **Apply these changes to all other cells with the same settings:** If this option is marked, Excel updates the applied validation to all the other cells when there is a match of the original validation of cell/cells being edited.



#### 4. How to add Data Validation in Excel?

To add a data validation in an Excel sheet, we must perform the following steps:

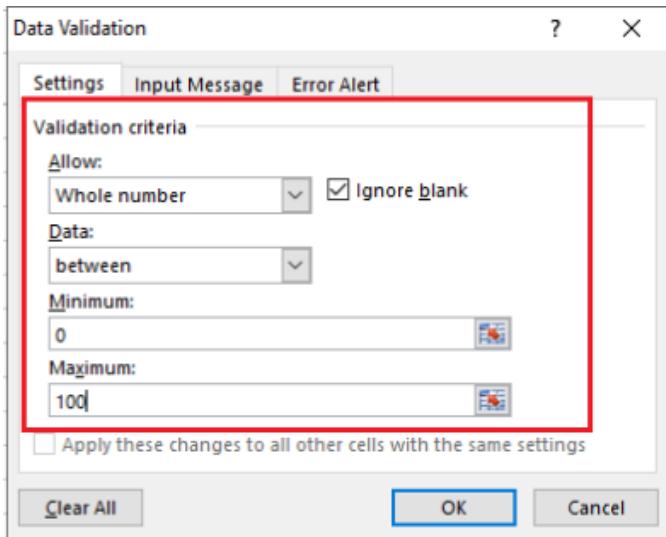
##### Step 1: Launch the Data Validation dialogue Box

First, we must select all the cells or a range to which we wish to apply validation. Next, we need to navigate the **Data tab - Data Tools** group and select '**Data Validation**' to launch the data validation dialogue box.

## Step 2: Set the Data Validation Rule

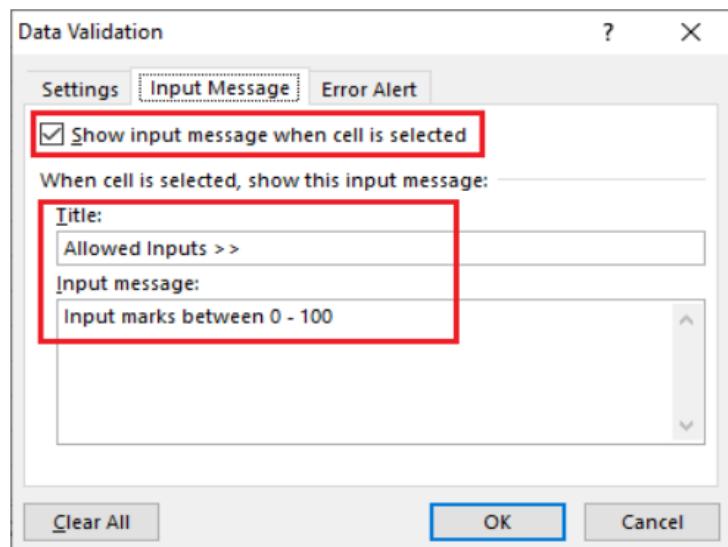
After the data validation dialogue box is displayed, we need to go to the Settings tab to define validation criteria.

Suppose we need to restrict users to enter marks for each student, but the marks must be supplied in between 0 to 100. This way, we can eliminate the chances of wrong inputs to some extent. For this, we need to set the criteria in the Settings tab as the following image:



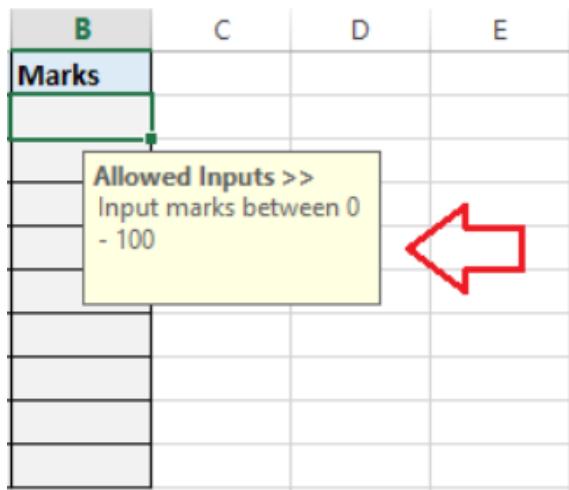
## Step 3: Create an Input Message to Display (Optional)

If we want to display a message to the user saying which type of data is supported or allowed in the selected cell, we can use the input message tab. Using the input message, we can inform the user regarding the allowed data type format when the user selects a corresponding cell/ cells. For example, we can display the following message into the desired fields (cell/cells/range).



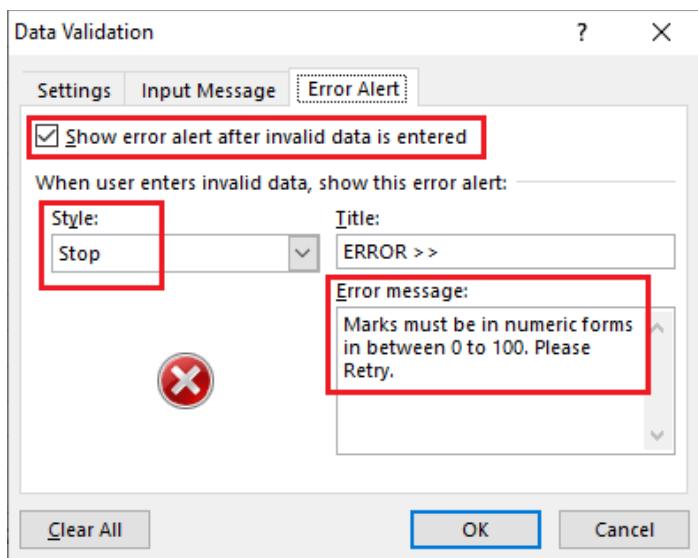
Once the input message is entered, we can click the OK button or move to the Error Alert tab further.

After setting up an input message, the corresponding cell (s) displays the message like this:

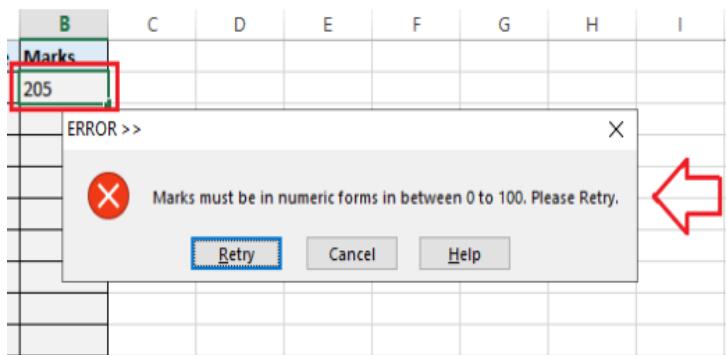


#### Step 4: Add an Error alert (Optional)

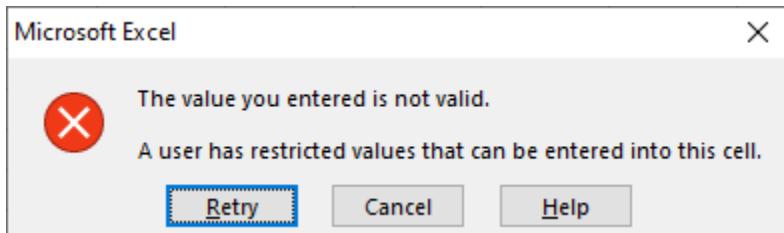
In addition to an input message, we can also set an error alert to display when the user enters invalid data into the respective cells. Moreover, we can also add a custom error message.



When the user enters invalid data, it triggers an error window with a message, and the invalid input is not allowed.



If we don't set a custom error alert and set the validation rules in Excel cell(s), Excel automatically displays the default error alert with the predefined error message. It looks like this:



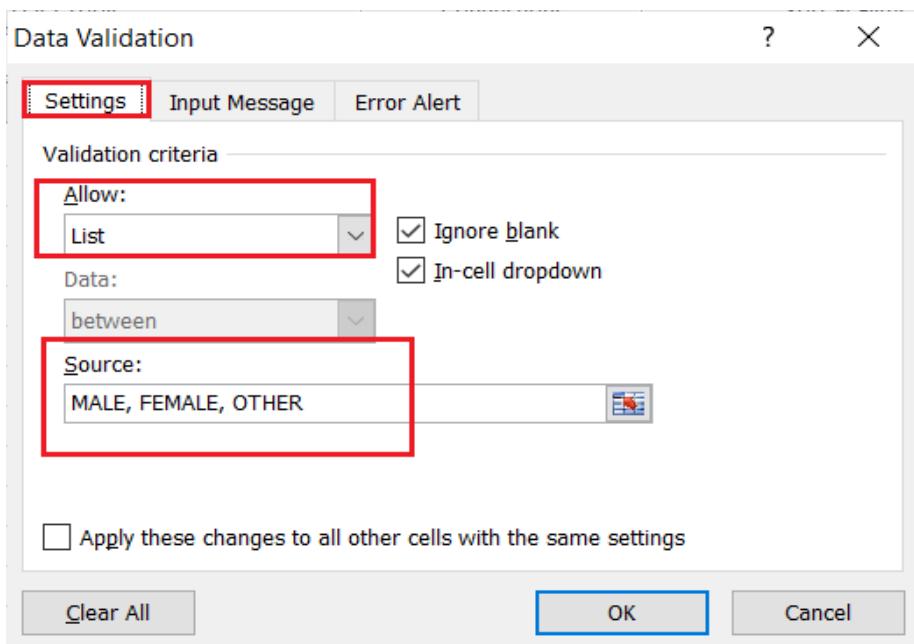
## 5. Data Validation Examples:

The following are some essential examples of Data Validation in Excel:

### Example 1: Restricting users to enter/choose specified values from the drop-down menu

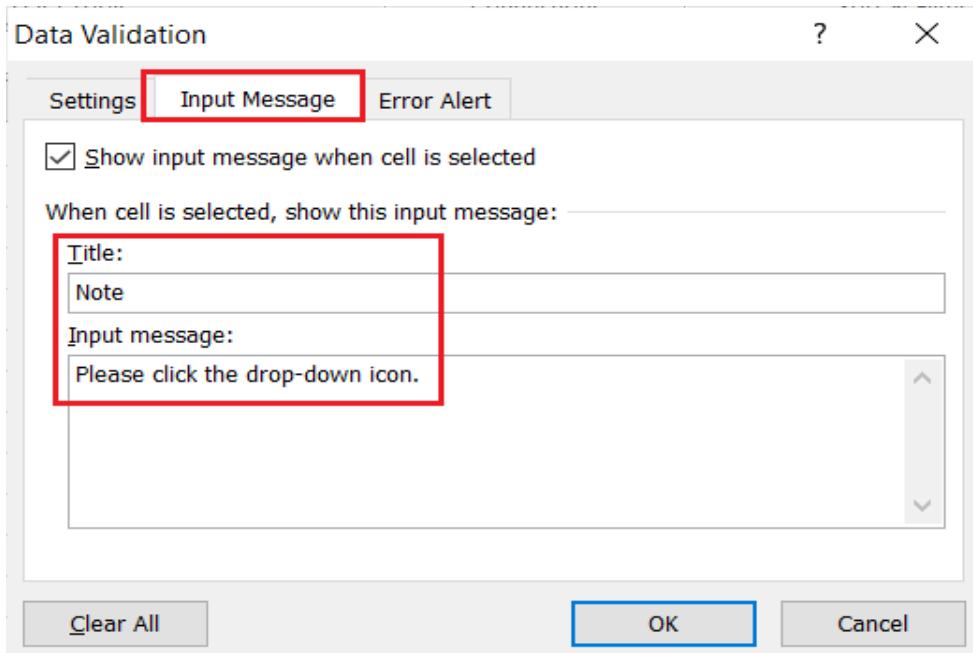
	A	B	C	D
1	Gender			
2		MALE FEMALE OTHER		
3				
4				
5				
6				
7				

### Settings Tab Values:

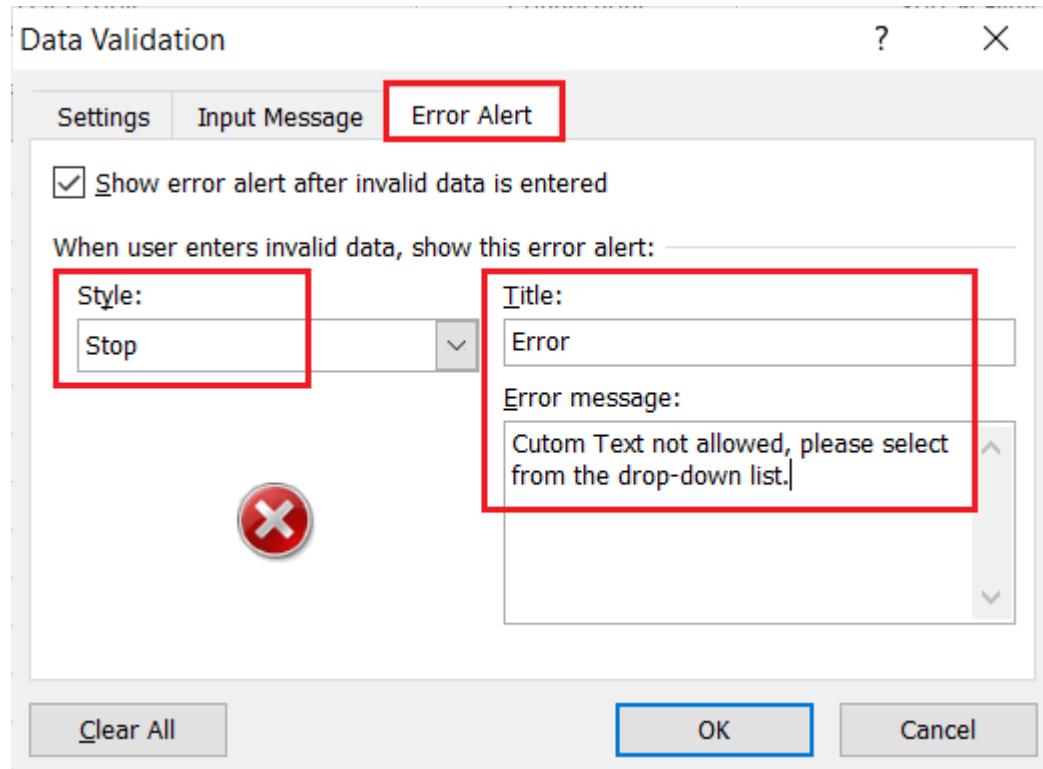
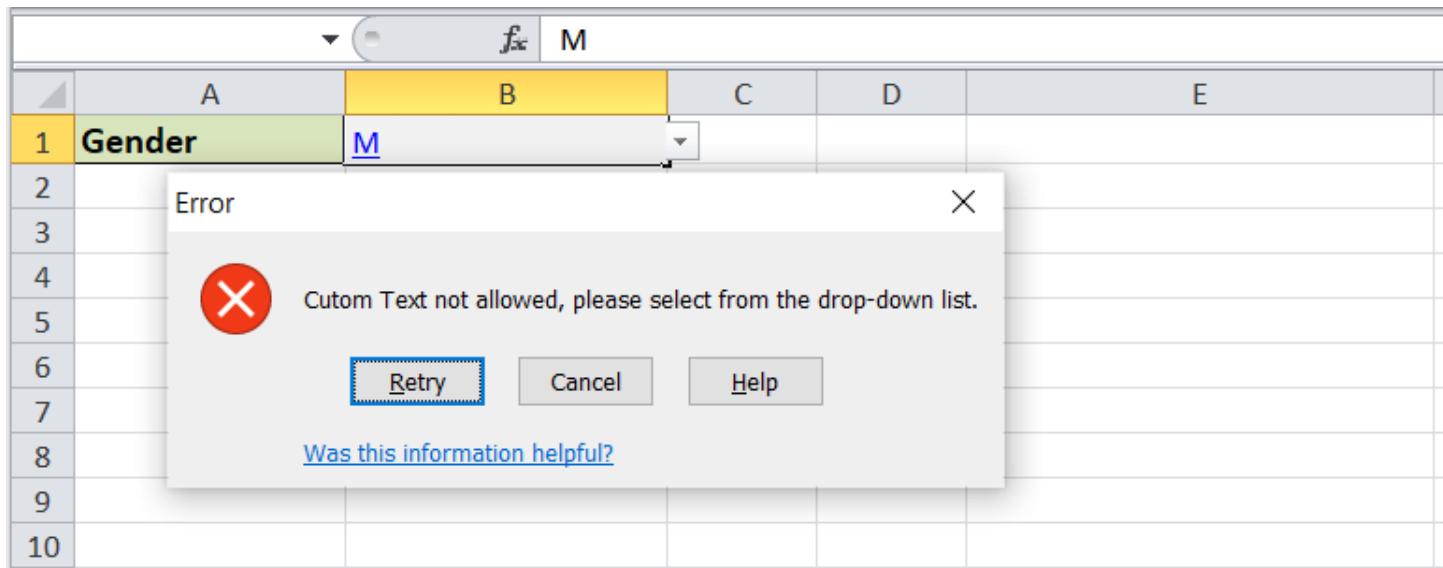


**Result after setting above conditions:**

B1	A	B	C	D
1	Gender	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <span>MALE</span>  <span>FEMALE</span>  <span>OTHER</span> </div> <span style="color: red; border: 2px solid red; padding: 2px;">the drop-down icon.</span>		
2				
3				
4				
5				
6				
7				

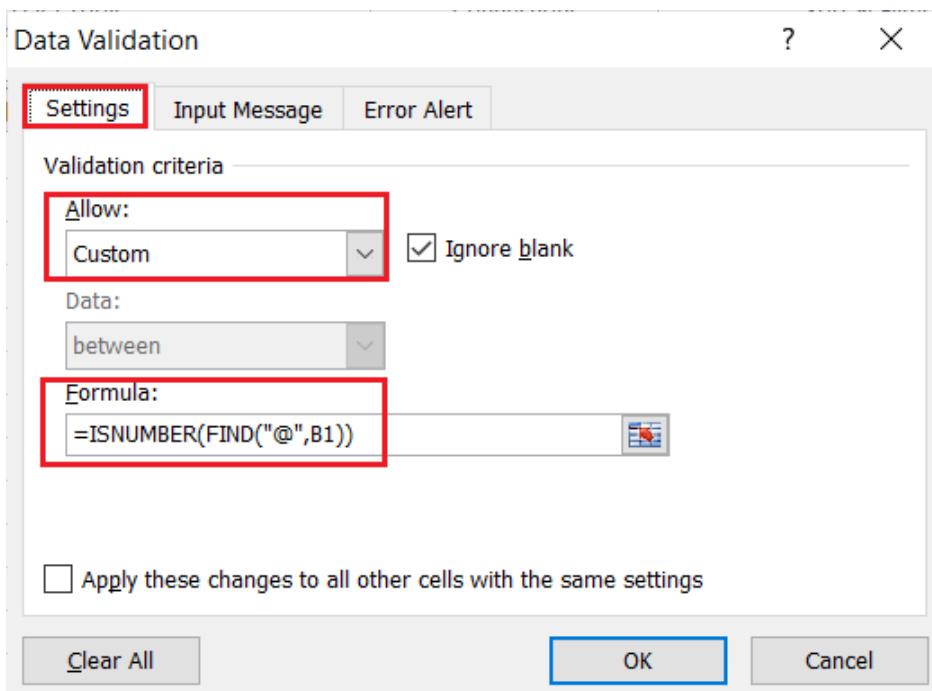
**Input Message Tab Values:****Result after setting above conditions:**

B1	A	B	C	D
1	Gender	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <span>Note</span>  <span>Please click the drop- down icon.</span> </div>		
2				
3				
4				
5				
6				
7				
8				

**Error Alert Tab Values:****Result after setting above conditions:**

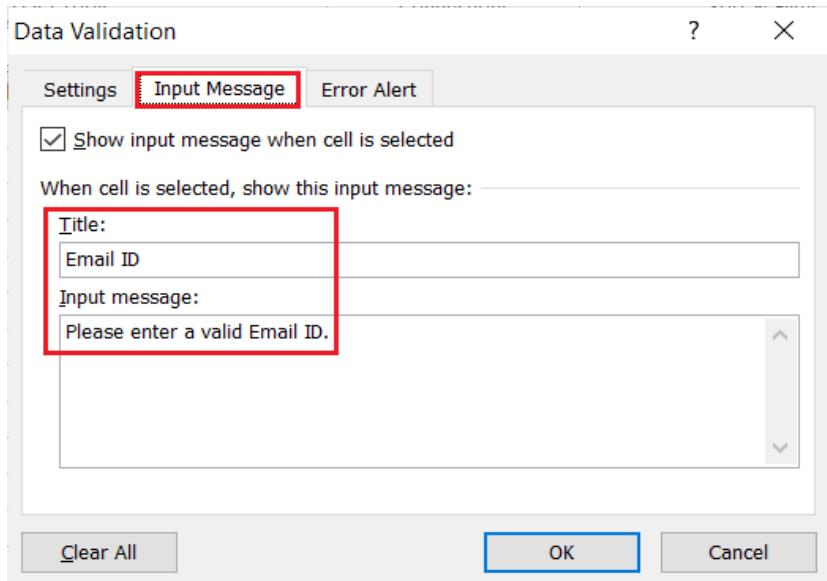
**Example 2: Restricting users to enter valid Email Id**

	A	B	C	D	E
1	Enter Email ID				
2					
3					
4					
5					
6					

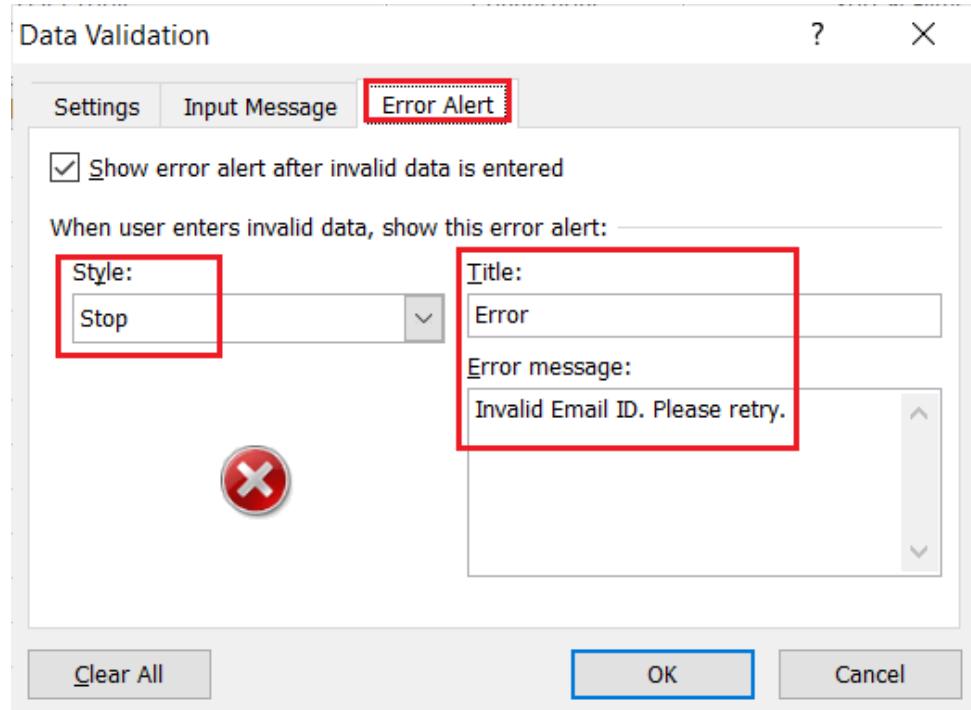
**Settings Tab Values:****Result after setting above conditions:**

	A	B	C	D
1	Enter Email ID			
2				
3				
4				
5				
6				
7				

A callout bubble appears over the empty cell B1, containing the message: "Email ID Please enter a valid Email ID."

**Input Message Tab Values:****Result after setting above conditions:**

	A	B	C	D
1	Enter Email ID	example@gmail.com		
2				
3				
4				
5				
6				

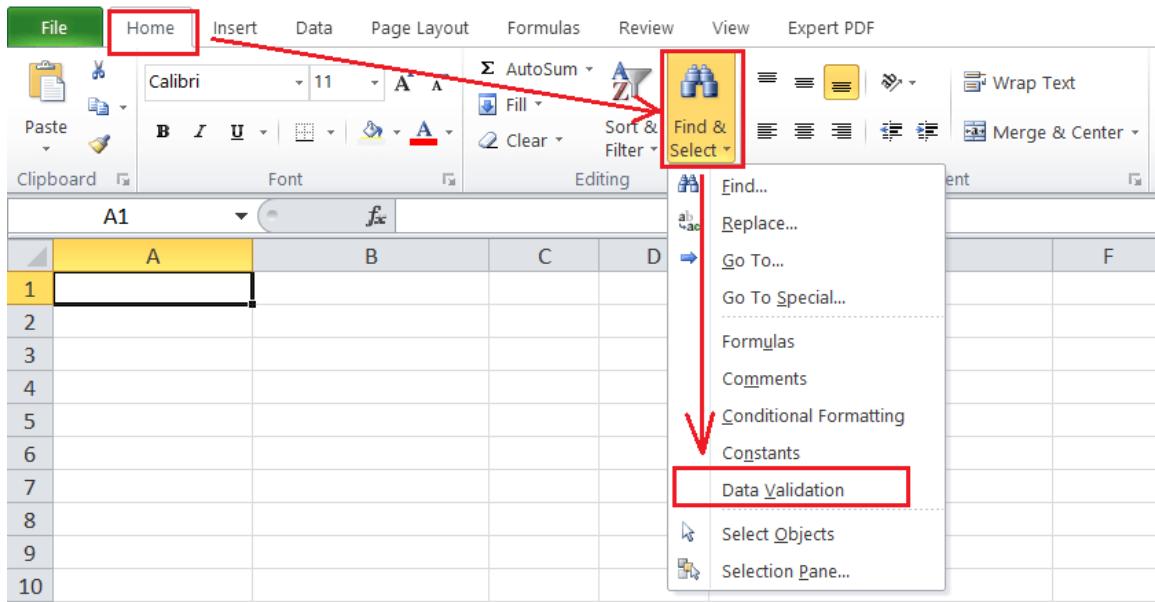
**Error Alert Tab Values:****Result after setting above conditions:**

The screenshot shows an Excel spreadsheet with a validation error message. Cell A1 contains 'Enter Email ID' and cell B1 contains 'example-gmail.com'. A validation error message box is displayed over the cells, titled 'Error' with a red X icon. The message reads 'Invalid Email ID. Please retry.' with buttons for 'Retry', 'Cancel', and 'Help'. Below the message box is a link 'Was this information helpful?'.

## 6. How to locate or find Data Validation?

We must perform the following steps to find cells with data validation in Excel:

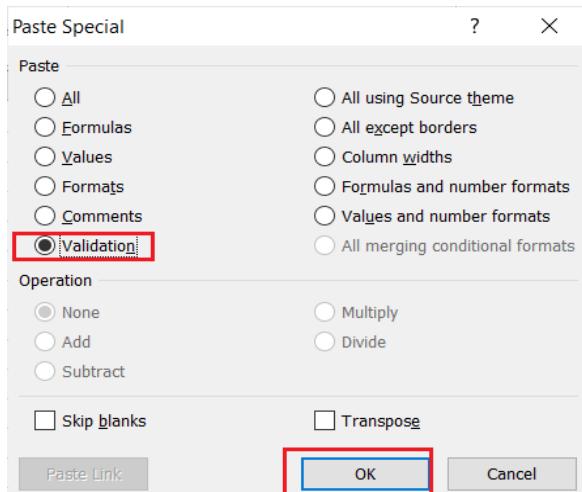
- Navigate the **Home** tab on the toolbar.
- Click the drop-down icon in a shortcut, '**Find & Select**' under the 'Editing' group.
- Select the '**Data Validation**' option from the list.



## 7. How to copy Validation Rules to other cells?

Suppose we have some cells with validation rules, and we want to apply the same validation rules on other cells. To do this, we can use Paste Special feature, as listed below:

- Select and copy the cells with validation using the shortcut **Ctrl + C**.
- Use the shortcut **Ctrl + Alt + V + N** to paste the copied cells onto the cells we wish to apply data validation. Alternately, we can launch the **paste special dialogue box** using the right-click menu options and select the '**Validation**' option.

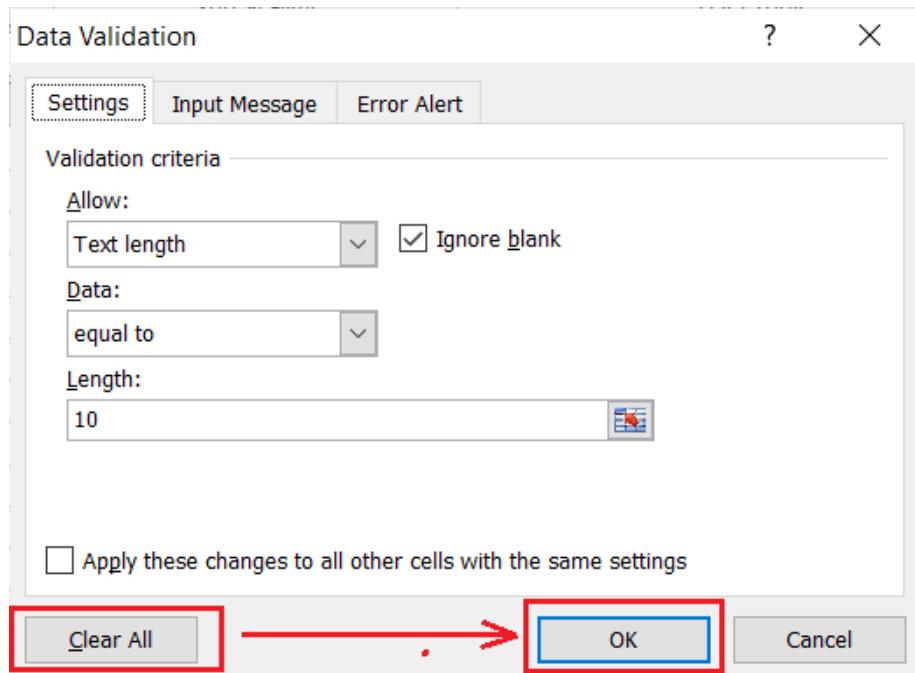


## 8. How to remove or clear Data Validation?

There are two common methods used to remove or clear all the validation in Excel:

### Method 1: Clear Data Validation using the Data Validation Dialog Box

- Select all the cells to remove data validation.
- Launch the **Data Validation dialogue box** from the ribbon.
- Click the option '**Clear All**' under the Settings tab and the **OK**



### Method 2: Clear Data Validation using Paste Special Feature

- Select empty cells without validation rules, and copy using the shortcut **Ctrl +C**.
- Select cell(s) with the validation from which the data validation is to be removed.
- Paste the contents using **Ctrl + V** and hit **Enter**

This method typically replaces the data validation with the empty cells, which is an indirect way of removing data validation in Excel.

## Pivot Tables:

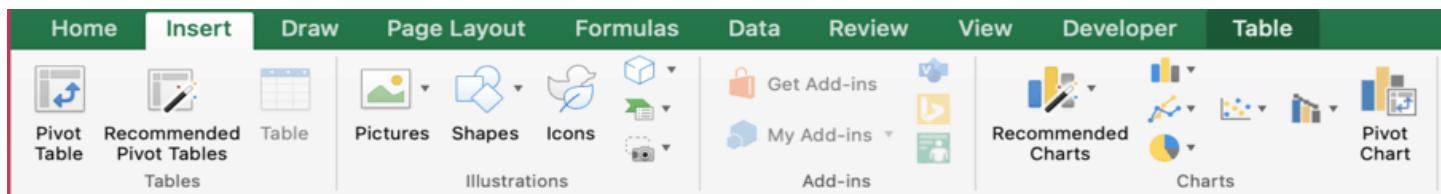
Pivot tables are one of Excel's most powerful features. A Pivot table is a summary of your data package. The word 'Pivot' in the Pivot table means to rotate the data in Excel to view it from a different perspective. Creating a Pivot table doesn't mean adding, subtracting, or changing the data, it simply means reorganizing the data so you can easily work with useful information. A pivot table allows you to extract the significance from a large, detailed data set.

	A	B	C	D	E	F	G	H	I
1	orderid	product	category	Quantity kg	Price/kg	Total Sale	date	country	
2	1	carrot	Vegetable	3	100	300	10-Aug	US	
3	2	Broccoli	Vegetable	1	60	60	11-Aug	US	
4	3	Beans	Vegetable	2	100	200	12-Aug	Canada	
5	4	banana	Fruit	2	120	240	13-Aug	germany	
6	5	Broccoli	Vegetable	1	60	60	14-Aug	Canada	
7	6	beans	Vegetable	2	100	200	15-Aug	France	
8	7	carrot	Vegetable	2	100	200	16-Aug	germany	
9	8	orange	Fruit	2	300	600	17-Aug	US	
10	9	beans	Vegetable	2	100	200	18-Aug	US	
11	10	orange	Fruit	2	300	600	19-Aug	Canada	
12									

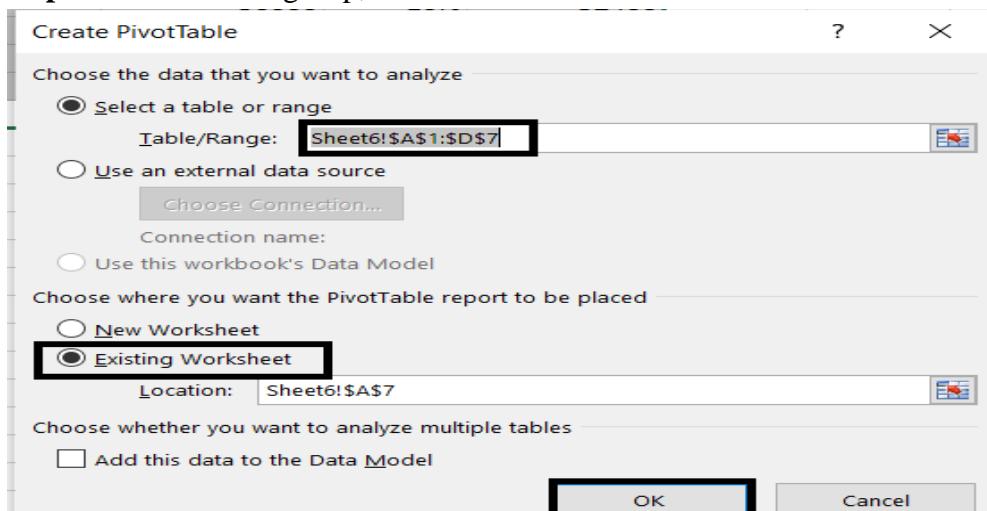
### 1. Create a Pivot Table:

**Step 1:** Select any cell inside the data set of which a pivot table has to be created.

**Step 2:** Go to the Insert tab.



**Step 3:** In the Tables group, click on the Pivot table tool



## Step 4: Fill the Dialog Box

A dialog box would open where we have to fill in the two choices for the data to be analyzed and the place where we wish to have the pivot table. After filling in the options, click on OK.

## Step 5: In the new sheet, we can see the pivot table and other options

## 2. Drag Fields:

To get the total amount exported of each product, drag the following fields to the different areas.

- Product field to the Rows area.
- Price field to the Values area.
- Country field to the Filters area.

Country	Sum of Price/kg
Banana	120
Beans	300
Broccoli	120
Carrot	200
Orange	600
<b>Grand Total</b>	<b>1340</b>

### 3. Filter:

Because we added the Country field to the Filters area, we can filter this pivot table by Country. For example, which products do we export the most to France?

- Click the filter drop-down and select France.

Result. Beans are our main export product to France.

	A	B
1	Country	France
2		
3	Row Labels	Sum of Price/kg
4	Beans	100
5	Grand Total	100
6		

### 4. Sort:

To get smaller value at the top of the list, sort the pivot table.

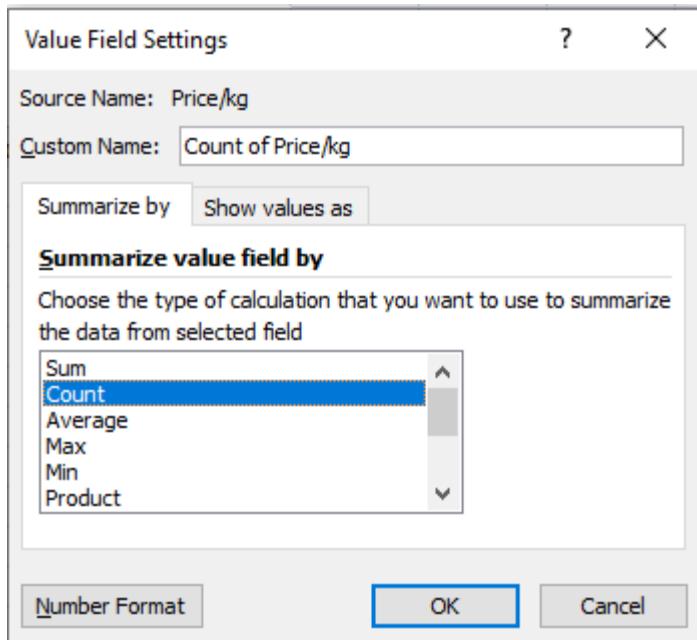
1. Click any cell inside the Sum of Amount column.
2. Right click and click on Sort -> Sort Smallest to Largest.

	A	B
1	Country	(All)
2		
3	Row Labels	Sum of Price/kg
4	Broccoli	120
5	Banana	120
6	Carrot	200
7	Beans	300
8	Orange	600
9	Grand Total	1340

### 5. Change Summary Calculation:

By default, Excel summarizes your data by either summing or counting the items. To change the type of calculation that you want to use, execute the following steps.

- Click any cell inside the Sum of Price column.
- Right click and click on Value Field Settings.



- Choose the type of calculation you want to use. For example, click Count.
- Click OK.

Result. 1 out of the 10 orders was 'Banana' order, 2 out of the 10 orders was 'Broccoli' 'Carrot', & 'Orange' orders and 3 out of the 10 orders was 'Beans' order.

	A	B
1	Country	(All)
2		
3	Row Labels	Count of Price/kg
4	Banana	1
5	Broccoli	2
6	Carrot	2
7	Orange	2
8	Beans	3
9	Grand Total	10

## 6. Two-dimensional Pivot Table:

If you drag a field to the Rows area and Columns area, you can create a two-dimensional pivot table.

- Country field to the Rows area.
- Product field to the Columns area.
- Price field to the Values area.
- Category field to the Filters area.

A screenshot of Microsoft Excel showing a PivotTable named "Experiment-3.xlsx". The PivotTable Field List on the right side lists fields such as OrderID, Product, Category, Quality/kg, Price/kg, Total Sale, Date, and Country. The PivotTable itself shows data grouped by Category (All) in row 1, Row Labels (Banana, Broccoli, Carrot, Orange, Beans) in row 4, and Column Labels (Grand Total) in row 9. The data includes rows for Canada, France, Germany, and US, with a Grand Total row at the bottom.

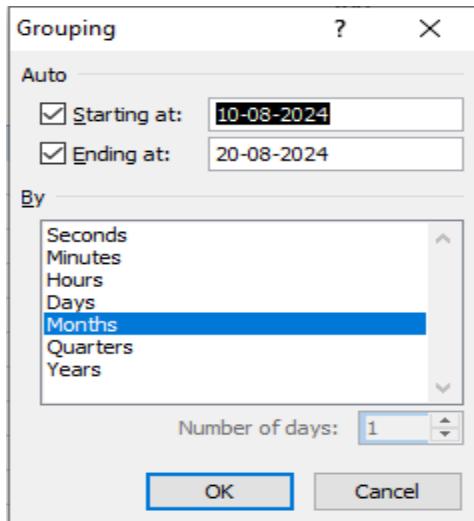
## 7. Grouping Data in a Pivot Table:

Excel allows you to group pivot table items. To create the groups, execute the following steps:

- In the pivot table, select the data you want to group.

A screenshot of Microsoft Excel showing a PivotTable named "Experiment-3.xlsx". The PivotTable Field List on the right side lists fields such as OrderID, Product, Category, Quality/kg, Price/kg, Total Sale, Date, and Country. The PivotTable itself shows data grouped by Category (All) in row 1, Row Labels (10-Aug, 11-Aug, 12-Aug, 13-Aug, 14-Aug, 15-Aug, 16-Aug, 17-Aug, 18-Aug, 19-Aug, Grand Total) in row 4, and Column Labels (10-Aug, 11-Aug, 12-Aug, 13-Aug, 14-Aug, 15-Aug, 16-Aug, 17-Aug, 18-Aug, 19-Aug, Grand Total) in row 5. The data includes rows for Canada, France, Germany, and US, with a Grand Total row at the bottom.

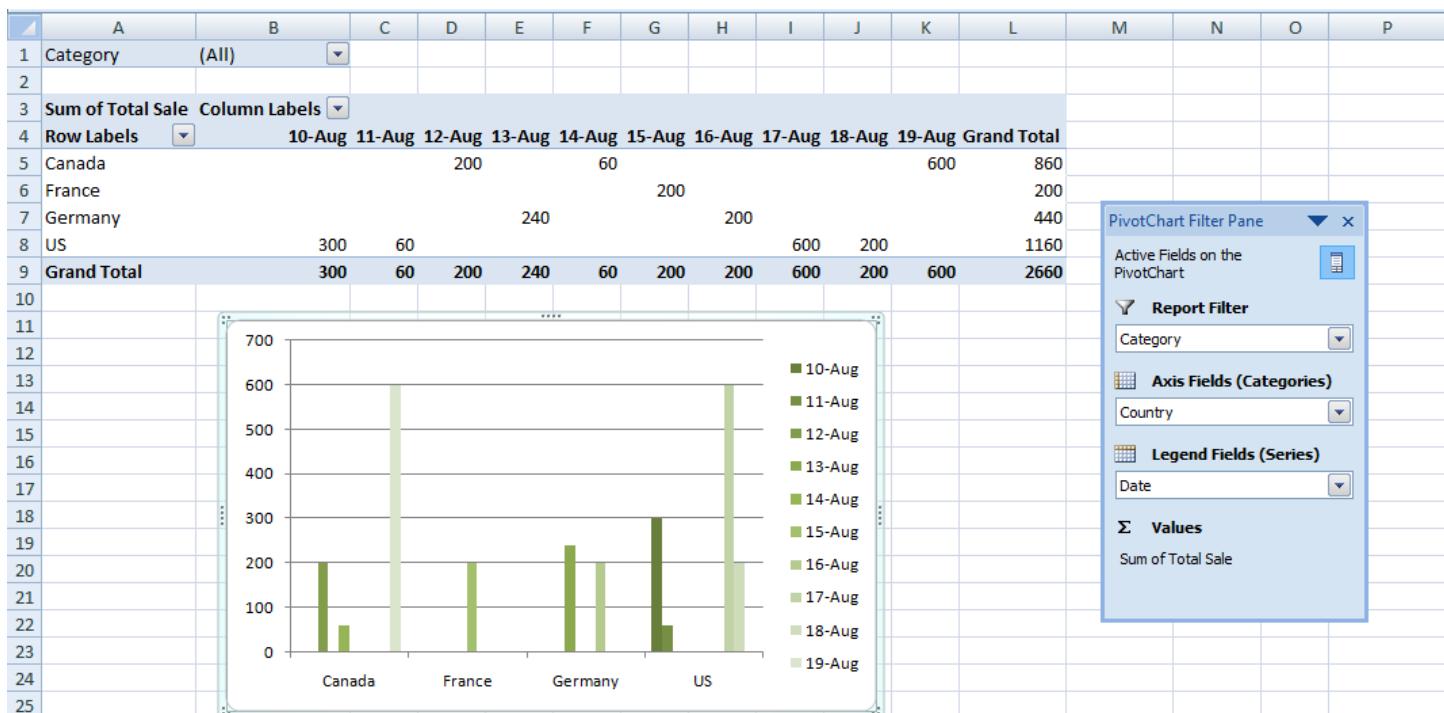
- Right-click and click on Group.



- Now, your data is grouped.

	A	B	C
1	Category	(All)	
2			
3	Sum of Total Sale	Column Labels	
4	Row Labels	Aug	Grand Total
5	Canada	860	860
6	France	200	200
7	Germany	440	440
8	US	1160	1160
9	Grand Total	2660	2660

### Pivot Chat:



## Program 4

**Aim: Data Analysis Process: Conditional Formatting, What-If Analysis, Data Tables, Charts & Graphs.**

The data analysis process techniques help to explore, analyze, and visualize data in a meaningful way.

### Conditional Formatting:

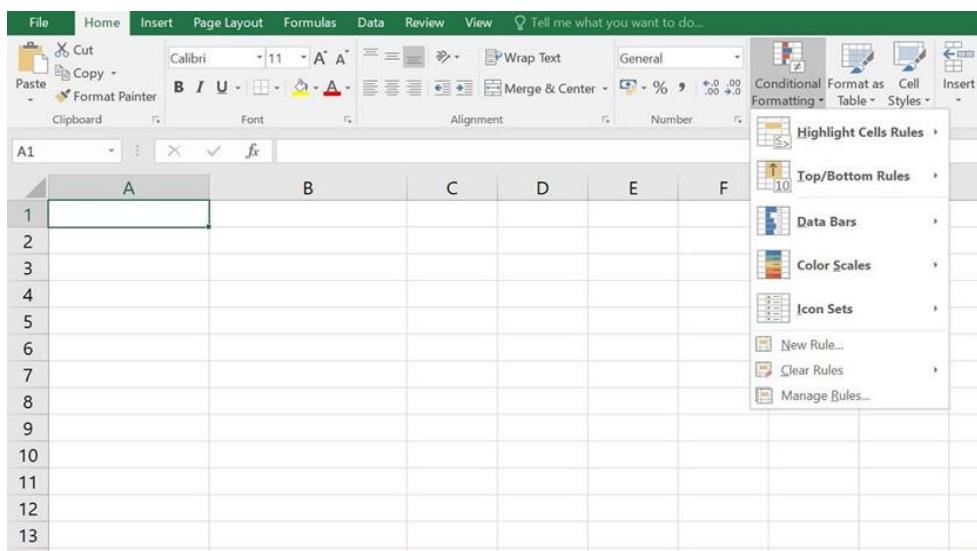
Excel's conditional formatting feature lets you dynamically format a cell's background and text style based on custom rules that you set. A rule in Excel operates as an if/then statement. Conditional formatting is used to change the appearance of cells in a range based on your specified conditions.

### Highlight Cells Using Conditional Formatting:

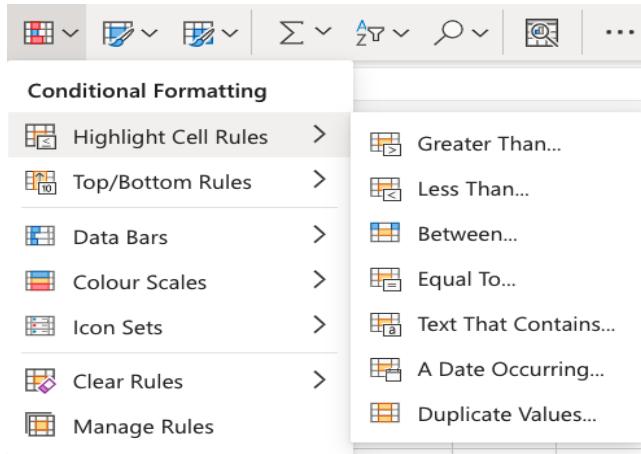
**Step 1:** Select the range of cells you want to apply the highlight.

	A	B	C	D	E	F
1	Bills	Jan-01	Feb-01	Mar-01	Total	Percentage
2	Rent	1,200.00	1,200.00	1,200.00	3,600.00	45.28%
3	Car	300	300	300	900	11.32%
4	Credit Cards	250	350	450	1050	13.21%
5	Internet	300	400	500	1200	15.09%
6	Grocery	400	400	2000	2800	15.09%
7						
8	Total	2,450.00	2,650.00	4,450.00	9,550.00	100.00%

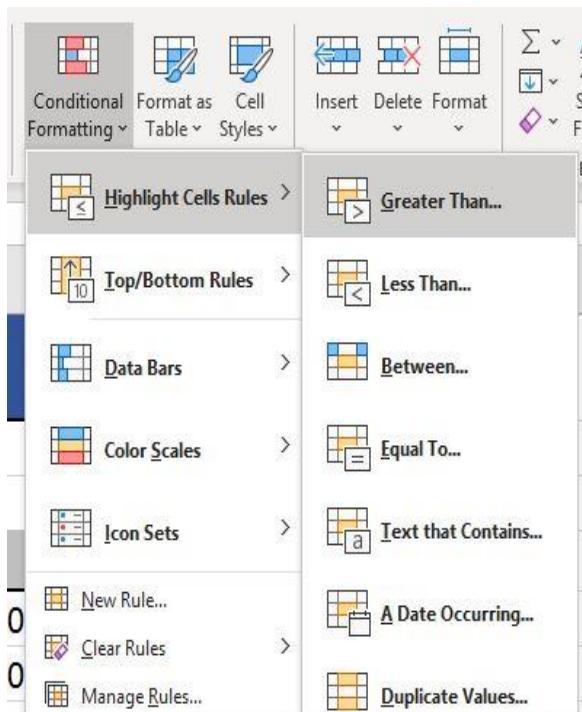
**Step 2:** Click on Conditional Formatting icon in the ribbon, from the Home menu.



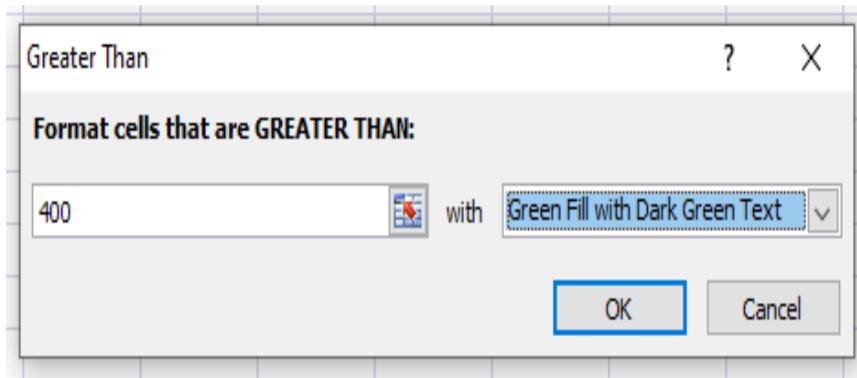
### Step 3: Excel Highlight Cell Rules.



- Click Highlight Cells Rules > Greater Than



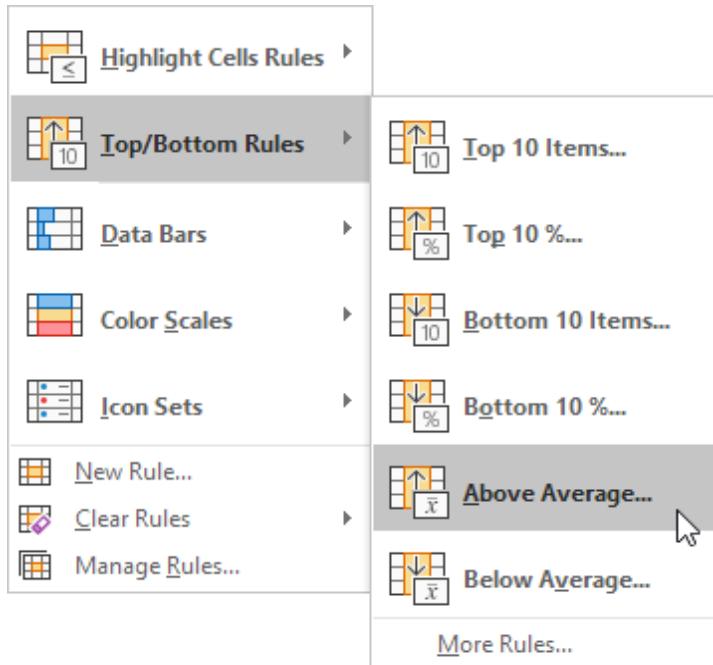
- Enter the desired value and select the formatting style.



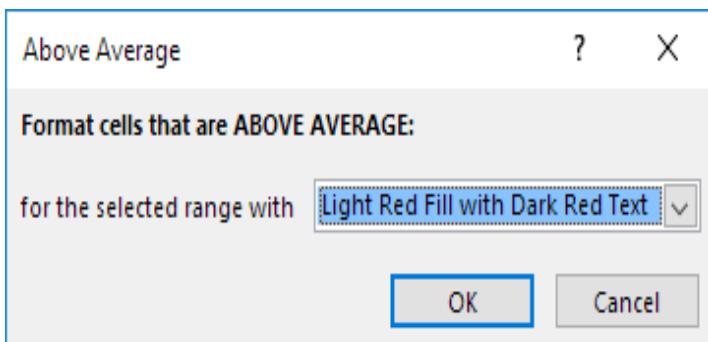
- Click OK.

	A	B	C	D	E	F
1	Bills	Jan-01	Feb-01	Mar-01	Total	Percentage
2	Rent	1,200.00	1,200.00	1,200.00	3,600.00	45.28%
3	Car	300	300	300	900	11.32%
4	Credit Cards	250	350	450	1050	13.21%
5	Internet	300	400	500	1200	15.09%
6	Grocery	400	400	400	1200	15.09%
7						
8	Total	2,450.00	2,650.00	2,850.00	7,950.00	100.00%

#### Step 4: Excel Top/Bottom Rules.



- Select a formatting style.



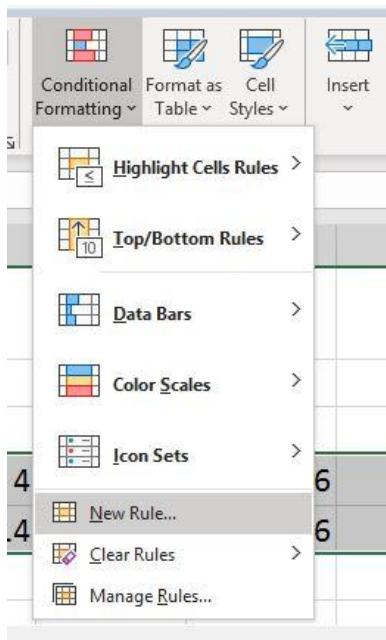
- Click OK.

Percentage
45.28%
11.32%
13.21%
15.09%
15.09%

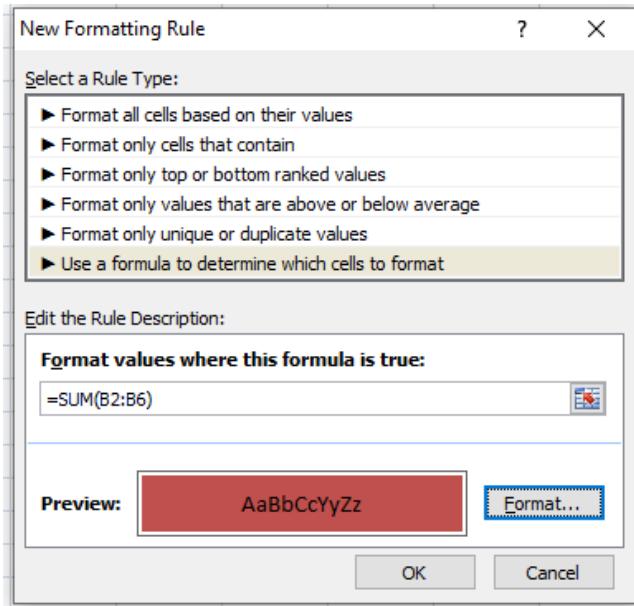
- Similarly, for other options like **Data Bars**, **Color Scales**, **Icon Sets**, the result is as shown below:

	A	B	C	D	E
1	Bills	Jan-01	Feb-01	Mar-01	Total
2	Rent	1,200.00	1,200.00	1,200.00	3,600.00
3	Car	300	300	300	900
4	Credit Cards	250	350	450	1050
5	Internet	300	400	500	1200
6	Grocery	400	400	400	1200

### Step 5: New Formatting Rule.



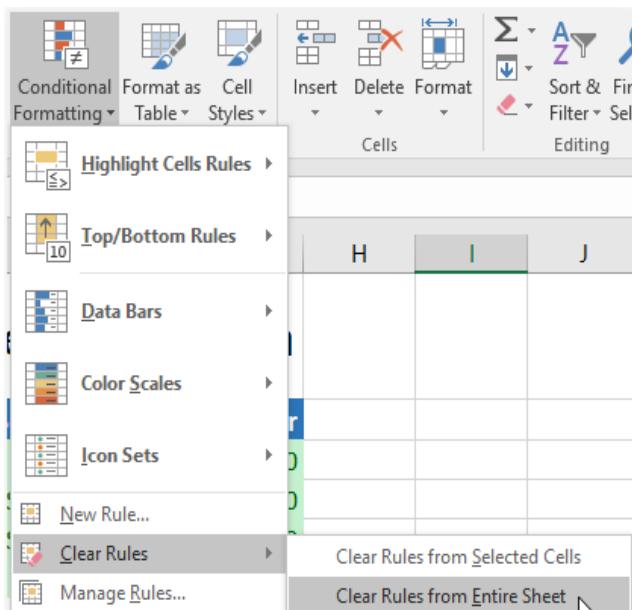
- Select ‘Use a formula to determine which cells to format’.
- Enter the formula.



- Select a formatting style and click OK.

	A	B	C	D	E	F
1	Bills	Jan-01	Feb-01	Mar-01	Total	Percentage
2	Rent	1,200.00	1,200.00	1,200.00	3,600.00	45.28%
3	Car	300	300	300	900	11.32%
4	Credit Cards	250	350	450	1050	13.21%
5	Internet	300	400	500	1200	15.09%
6	Grocery	400	400	400	1200	15.09%
7						
8	Total	2,450.00	2,650.00	2,850.00	7,950.00	100.00%

#### Step 6: Removing conditional formatting.



## What-if analysis

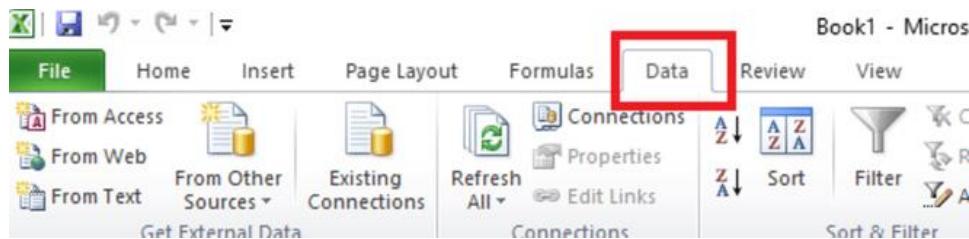
Excel includes powerful tools to perform complex mathematical calculations, including **what-if analysis**. This feature can help you **experiment** and **answer questions** with your data, even when the data is incomplete.

### Scenario manager:

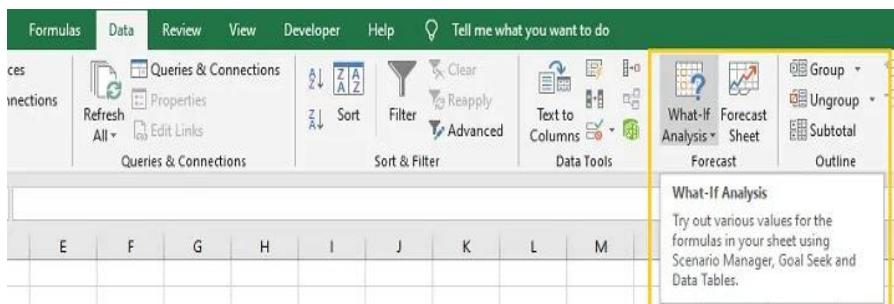
**Step 1:** Given a data set, for **Revenue Cost of Jan**, with **Metal\_name** and **Cost** as its columns.

	A	B	C
1	<b>Revenue cost of Jan</b>		
2	<b>Metal_name</b>	<b>Cost</b>	
4	Iron	500	
5	Copper	5000	
6	Silver	10000	
7	Gold	25000	
8	Bronze	15000	
9			
10	<b>Total_cost</b>		55500
11			

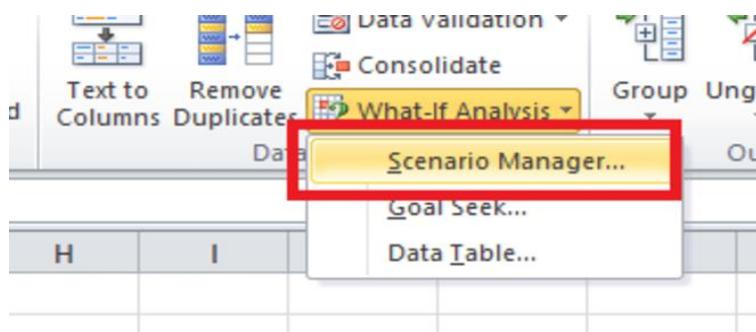
**Step 2:** Select the numerical value cell and Go to the **Data**.



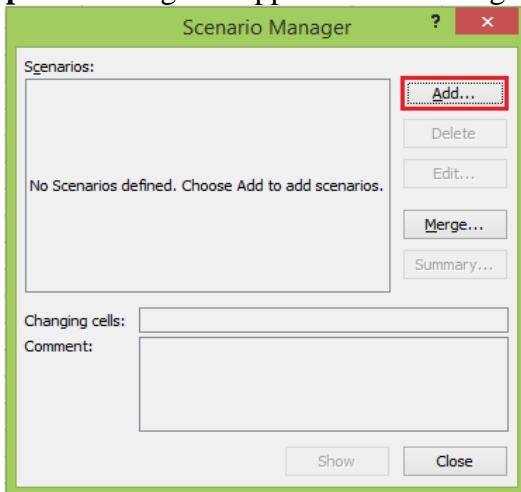
**Step 3:** Under the **forecast** section, click on the **What-if analysis**.



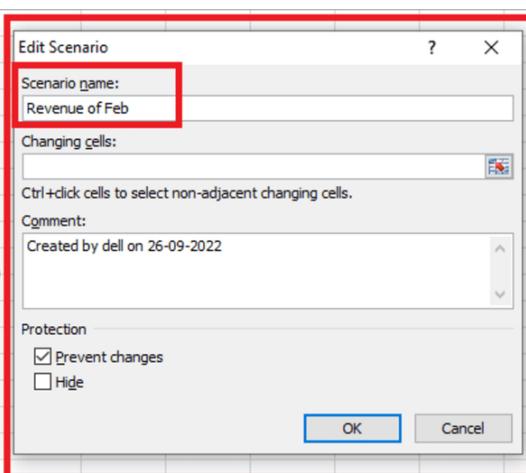
**Step 4:** A drop-down appears. Select the **Scenario manager**.



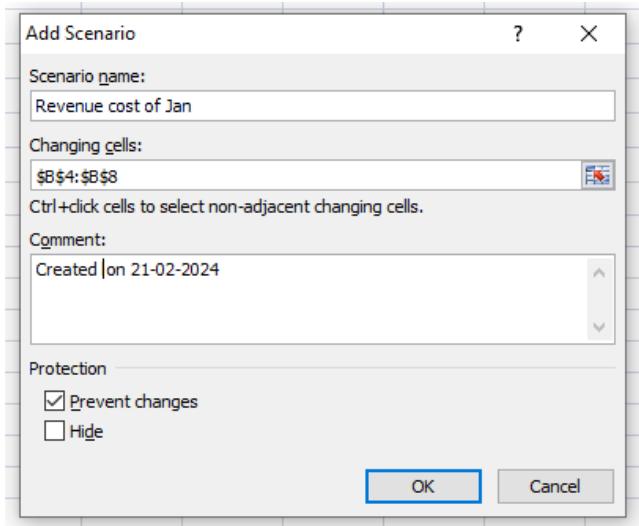
**Step 5:** A dialog box appears in the dialog box select **add option**.



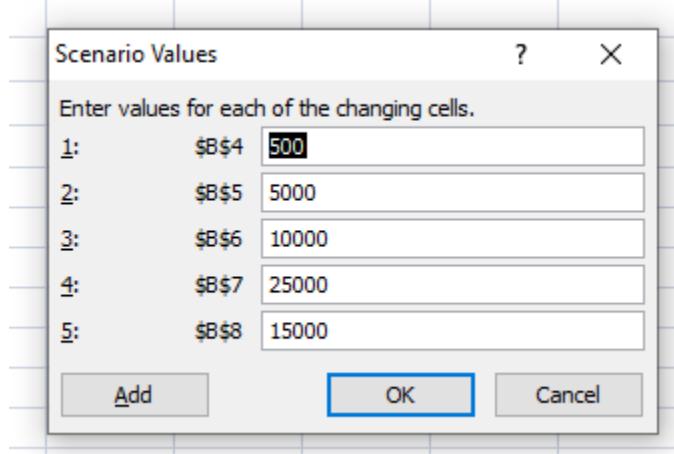
**Step 6:** A new dialog appears to write the name of the **new scenario** in the first column. Under **Scenario name**, write “Revenue of Feb”.



**Step 7:** In the second column select the changing cell. The **changing cells** for this example are \$B\$4:\$B\$8.

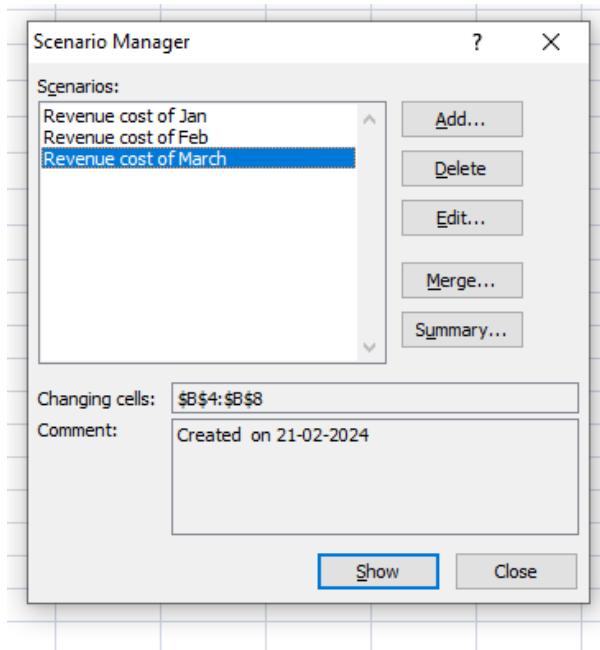


**Step 8:** A new dialogue box name **Scenario Values** appears to write the changed value in the box. Enter the values as per shown in the image. Click **Ok**.

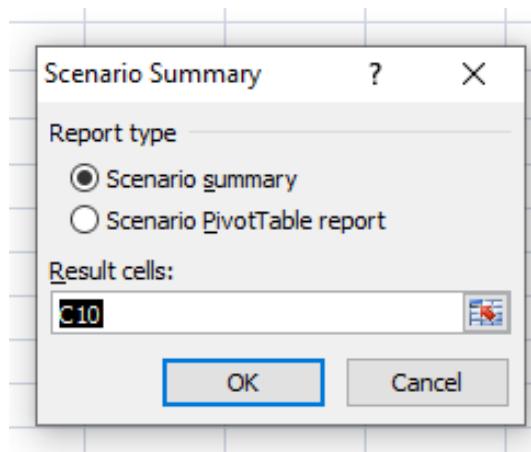


**Step 9:** Repeat **step5**, **step6**, and **step8**.

**Step 10:** Click **Ok** then select **summary**.



**Step 11:** A new Dialog box name **Scenario Summary** appears. Select **Result cells: \$C\$10**.



**Step 12:** See the result.

Scenario Summary				
	Current Values:	Revenue cost of Jan	Revenue cost of Feb	Revenue cost of March
<b>Changing Cells:</b>				
\$B\$4	500	20000	2000	500
\$B\$5	5000	5000	5000	5000
\$B\$6	10000	10000	10000	50000
\$B\$7	25000	25000	25000	25000
\$B\$8	15000	15000	15000	15000
<b>Result Cells:</b>				
\$C\$10	55500	75000	57000	95500

Notes: Current Values column represents values of changing cells at time Scenario Summary Report was created. Changing cells for each scenario are highlighted in gray.

### Goal Seek:

In the image below, you can see that the grades on the first four assignments are **58, 70, 72**, and **60**. Even though we don't know what the fifth grade will be, we can write a formula, which calculates the final grade. In this case, each assignment is weighted equally, so all we have to do is average all five grades by typing **=AVERAGE (B2:B6)**.

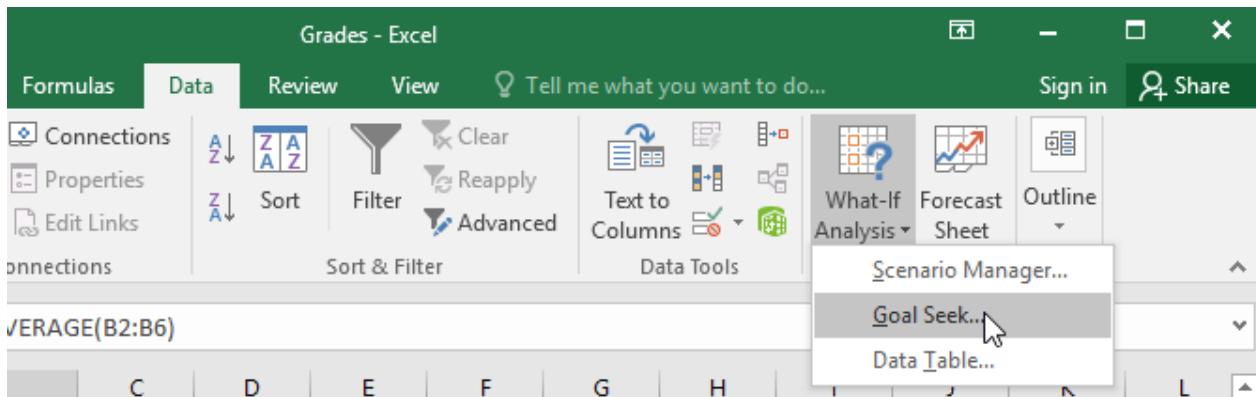
Once we use Goal Seek, cell **B6** will show us the minimum grade we'll need to make on that assignment.

SUM	A	B	C	D
	A	B	C	D
1	Assignment	Grade		
2	Paper 1	58		
3	Paper 2	70		
4	Quiz	72		
5	Lab	60		
6	Final Exam			
7	Final Grade	=AVERAGE(B2:B6)		
8				

**Step 1:** Select the cell with the value you want to change. Whenever you use Goal Seek, you'll need to select a cell that already contains a **formula** or **function**. In our example, we'll select cell **B7** because it contains the formula **=AVERAGE (B2:B6)**.

	A	B	C	D
1	Assignment	Grade		
2	Paper 1	58		
3	Paper 2	70		
4	Quiz	72		
5	Lab	60		
6	Final Exam			
7	Final Grade	65	+	
8				

**Step 2:** From the **Data** tab, click the **What-If Analysis** command, then select **Goal Seek** from the drop-down menu.



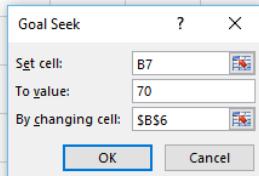
**Step 3:** A dialog box will appear with three fields. The first field, **Set cell:**, will contain the desired result. In our example, cell **B7** is already selected.

The second field, **To value:**, is the desired result. In our example, we'll enter **70** because we need to earn at least that to pass the class.

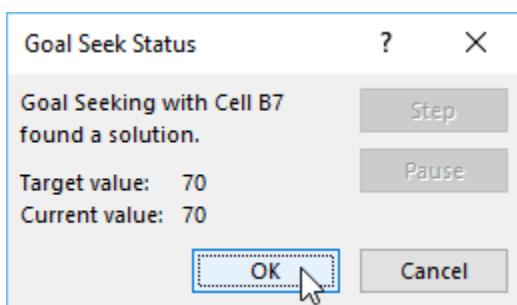
The third field, **By changing cell:**, is the cell where Goal Seek will place its answer. In our example, we'll select cell **B6** because we want to determine the grade we need to earn on the final assignment.

**Step 4:** When you're done, click **OK**.

	B6	X	✓	f(x)	=AVERAGE(B2:B6)	
1	A	B	C	D	E	F
2	Assignment	Grade				
3	Paper 1	58				
4	Paper 2	70				
5	Quiz	72				
6	Lab	60				
7	Final Exam	65	+ 65			
8	Final Grade	65				



**Step 5:** The dialog box will tell you if Goal Seek was able to find a solution. Click **OK**.



**Step 6:** The result will appear in the specified cell. In our example, Goal Seek calculated that we will need to score at least a 90 on the final assignment to earn a passing grade.

	B6	X	✓	f(x)	90
1	A	B	C	D	
2	Assignment	Grade			
3	Paper 1	58			
4	Paper 2	70			
5	Quiz	72			
6	Lab	60			
7	Final Exam	90	+ 90		
8	Final Grade	70			

## Data Tables:

A Data Table in Excel helps study the different outputs obtained by changing one or two inputs of a formula. A data table does not allow changing more than two inputs of a formula.

Two different types of data tables in Excel are specified as follows:

- One-variable data table
- Two-variable data table

### One-Variable Data Table in Excel

A one-variable data table is created to study how a change in one input of the formula causes a change in the output. A one-variable data table in excel can be either row-oriented or column-oriented.

#### **Example #1**

There are two images titled “Image 1” and “Image 2.” The following information is given:

- Image 1 shows an organization’s revenue for 2018 in cell B2. The minimum growth rate expected is given as 12% in cell B3. The projected revenue (in cell B5) for 2019 has been calculated by using the formula “=B2+(B2\*B3).”
- Image 2 shows the possible values (in column C) that the growth rate can assume. The value of cell D8 has been explained in steps 1 and 2 (given further in this example).

We want to perform the following tasks:

- Calculate the projected revenues (in column D) according to the different growth rates (in column C) given in image 2.
- Create a “line with markers” chart showing the growth rates on the x-axis and the projected revenues on the y-axis. Replace the markers of the chart with arrows.

Use a one-variable data table of Excel. Interpret the data table thus created.

#### **Image 1**

	A	B	C
1	Year	Revenue	
2	2018	\$ 1,500,000	
3	Minimum Expected Growth Rate	12.00%	
5	<b>Projected Revenue for 2019</b>	<b>\$ 1,680,000</b>	
6			
7			

#### **Image 2**

	C	D	E
6			
7		Revenue	
8	Growth Rate	\$1,680,000	
9	12.50%		
10	13.50%		
11	14.50%		
12	15.50%		
13	16.50%		
14	17.50%		
15	18.50%		
16	19.50%		
17	20.50%		
18	21.50%		
19	22.50%		
20			
21			

The steps for performing the given tasks by using a one-variable data table are listed as follows:

**Enter the data of the two images in Excel. In cell D8, type “equal to” (=) followed by the reference B5.**

**This links cell D8 to cell B5.**

The linking of the two cells is shown in the following image.

Since all the growth rates have been entered vertically (C9:C19), our data table is said to be column-oriented. The entire range C8:D19 is our one-variable data table. We are creating a one-variable data table as the change in outputs will be observed against a change in one input, i.e., the growth rate.

Had we not linked cells D8 and B5, any changes to the formula of cell B5 would not have changed the value in cell D8. Consequently, the outputs in the range D9:D19 would not have been updated automatically.

	A	B	C	D	E
1	Year	Revenue			
2	2018	\$ 1,500,000			
3	Minimum Expected Growth Rate	12.00%			
5	Projected Revenue for 2019	\$1,680,000			
6					
7					
8			Revenue		
9		Growth Rate	=B5		
10			12.50%		
11			13.50%		
12			14.50%		
13			15.50%		
14			16.50%		
15			17.50%		
16			18.50%		
17			19.50%		
18			20.50%		
19			21.50%		
20			22.50%		

Press the “Enter” key. Cell D8 shows the value of cell B5, as shown in the following image.

Notice that if one manually enters the value (1680000) in cell D8, the data table will not work. Moreover, one should always type the formula [=B2+(B2\*B3)] or link the cell that is one row above and one column to the right of the possible input values (C9:C19). This is the reason we chose to link cell D8 to cell B5.

**Note:** If the data table is row-oriented, type the formula or link the cell that is one column to the left and one cell below the first possible input value. For instance, had the possible input values been in the range F2:P2, We would have entered the formula or linked cell E3 to cell B5.

	A	B	C	D	E
1	Year	Revenue			
2	2018	\$ 1,500,000			
3	Minimum Expected Growth Rate	12.00%			
5	Projected Revenue for 2019	\$1,680,000			
6					
7					
8			Revenue		
9		Growth Rate	\$1,680,000		
10			12.50%		
11			13.50%		
12			14.50%		
13			15.50%		
14			16.50%		
15			17.50%		
16			18.50%		
17			19.50%		
18			20.50%		
19			21.50%		
20			22.50%		
21					

**Step 1:** Select the range of the data table. This selection should include the linked cell (D8), the possible input values (C9:C19), and the empty cells for outputs (D9:D19). Hence, we have selected the range C8:D19, as shown in the following image.

	A	B	C	D	E
1	Year	Revenue			
2	2018	\$ 1,500,000			
3	Minimum Expected Growth Rate	12.00%			
5	Projected Revenue for 2019	\$ 1,680,000			
6					
7					
8			<b>Revenue</b>		
9			Growth Rate \$1,680,000		
10			12.50%		
11			13.50%		
12			14.50%		
13			15.50%		
14			16.50%		
15			17.50%		
16			18.50%		
17			19.50%		
18			20.50%		
19			21.50%		
20			22.50%		
21					

**Step 2:** From the Data tab, click the “what-if analysis” drop-down. Select the option “data table.” This option is shown in the following image.

The screenshot shows a Microsoft Excel spreadsheet with the following data:

	A	B	C	D	E
1	Year	Revenue			
2	2018	\$ 1,500,000			
3	Minimum Expected Growth Rate	12.00%			
5	Projected Revenue for 2019	\$ 1,680,000			
6					
7					
8			<b>Revenue</b>		
9			Growth Rate \$1,680,000		
10			12.50%		
11			13.50%		
12			14.50%		
13			15.50%		
14			16.50%		
15			17.50%		
16			18.50%		
17			19.50%		
18			20.50%		
19			21.50%		
20			22.50%		

The 'Data' tab is selected in the ribbon. A red arrow points to the 'What-If Analysis' button in the 'Data Tools' group. Another red arrow points to the 'Data Table' option in the dropdown menu.

**Step 3:** The “data table” dialog box opens, as shown in the following image. **In the box of “column input cell,” select cell B3, this contains the minimum expected growth rate.**

**As a result, the reference \$B\$3 appears in this box. Leave the box of “row input cell” blank.**

By giving the reference to cell B3 in the “column input cell,” we are telling Excel that at the growth rate of 12%, the projected revenue is \$1,680,000. So, with this data table, Excel is being asked the projected revenue when the growth rates vary from 12.5% to 22.5%.

In a one-variable data table, either the “row input cell” or the “column input cell” is specified depending on whether the data table is row-oriented or column-oriented.

**Step 4:** Click “Ok” in the “data table” window. The range D9:D19 of the data table has been filled with values.

The different outputs are shown in the following image.

Growth Rate				
	A	B	C	D
1	Year	Revenue		
2	2018	\$ 1,500,000		
3	Minimum Expected Growth Rate	12.00%		
5	Projected Revenue for 2019	\$1,680,000		
6				
7				
8		<b>Revenue</b>		
9		Growth Rate		
10		\$1,680,000		
11		12.50%		
12		1,687,500		
13		13.50%		
14		1,702,500		
15		14.50%		
16		1,717,500		
17		15.50%		
18		1,732,500		
19		16.50%		
20		1,747,500		
		17.50%		
		1,762,500		
		18.50%		
		1,777,500		
		19.50%		
		1,792,500		
		20.50%		
		1,807,500		
		21.50%		
		1,822,500		
		22.50%		
		1,837,500		

## Two-Variable Data Table in Excel

A two-variable data table in excel helps study how changes in two inputs of a formula cause a change in the output. In a two-variable data table, there are two ranges of possible values for the two inputs. From these two ranges, one range is in a row and the other is in a column of Excel.

### Example #2

There are three images titled “image 1,” “image 2,” and “image 3.” The following information is given:

- Image 1 shows an organization’s revenue (in \$ in 2018) and the minimum growth rate in cells B2 and B3 respectively. Both these figures are the same as that of the previous example. Additionally, the organization gives a 2% discount (in cell B4) to its customers. This is given to boost sales.
- Image 2 shows how the projected revenue (in \$ in cell B6) for 2019 has been calculated. The formula “=B2+(B2\*B3)-(B2\*B4)” is used for this purpose. The amount obtained (\$1,650,000) is the projected revenue after the discount.

- Image 3 shows the different values in row 9 that the discount rate can assume. The possible values that the growth rate can assume are given in column D. The value of cell D9 has been explained in steps 1 and 2 (given further in this example).

Calculate the projected revenues (in E10:J18) according to the various discount rates (in row 9) and growth rates (in column D). Use a two-variable data table of Excel. Interpret the data table thus created.

### Image 1

	A	B	C
1	Year	Revenue	
2	2018	\$ 1,500,000	
3	Minimum Expected Growth Rate	12.00%	
4	Discount Rate	2.00%	
6	Projected Revenue for 2019	\$ 1,650,000	
7			
8			

### Image 2

DSUM	<input type="button" value="x"/>	<input type="button" value="v"/>	<input type="button" value="fx"/>	=B2+(B2*B3)-(B2*B4)
	A	B	C	D
1	Year	Revenue		
2	2018	\$ 1,500,000		
3	Minimum Expected Growth Rate	12.00%		
4	Discount Rate	2.00%		
6	Projected Revenue for 2019	=B2+(B2*B3)-(B2*B4)		
7				
8				

### Image 3

	C	D	E	F	G	H	I	J	K
7									
8		Discount Rate							
9	\$1,650,000	2.50%	3.00%	3.50%	4.00%	4.50%	5.00%		
10	12.50%								
11	13.50%								
12	14.50%								
13	15.50%								
14	16.50%								
15	17.50%								
16	18.50%								
17	19.50%								
18	20.50%								
19									

The steps for creating a two-variable data table are listed as follows:

**Step 1:** Enter the data of the preceding images in Excel. In cell D9, type the “equal to” operator followed by the reference B6.

This time we have chosen to link cell D9 to cell B6. Alternatively, we could have also entered the formula [=B2+(B2\*B3)-(B2\*B4)] in cell D9. This is because, in a two-variable data table, one should type the formula or link the cell that is one column to the left of the first horizontal input value (2.5%). At the same time, this cell should be one row above the first vertical input value (12.5%).

The linking of cells ensures that any changes to the formula of cell B6 are reflected in the value of cell D9. Further, any change in the value of cell D9 will update the outputs (in E10:J18) automatically.

		Discount Rate						
		=B6	2.50%	3.00%	3.50%	4.00%	4.50%	5.00%
		12.50%						
		13.50%						
		14.50%						
		15.50%						
		16.50%						
		17.50%						
		18.50%						
		19.50%						
		20.50%						

**Step 2:** Press the “Enter” key. Cell D9 shows the value of cell B6, which is 1,650,000. This is shown in the following image.

The entire range D9:J18 is our two-variable data table. Notice that the excel data table shows the possible discount rates horizontally (in bold in row 9) and the possible growth rates vertically (in column D). This time the variation in outputs resulting from changes in both these inputs (discount rate and growth rate) need to be studied.

**Note:** If the value is entered manually in cell D9, the excel data table will not work.

	A	B	C	D	E	F	G	H	I	J
1	Year	Revenue								
2	2018	\$ 1,500,000								
3	Minimum Expected Growth Rate	12.00%								
4	Discount Rate	2.00%								
6	Projected Revenue for 2019	\$ 1,650,000								

	Discount Rate						
	\$ 1,650,000	2.50%	3.00%	3.50%	4.00%	4.50%	5.00%
Growth Rate	12.50%						
10	13.50%						
11	14.50%						
12	15.50%						
13	16.50%						
14	17.50%						
15	18.50%						
16	19.50%						
17	20.50%						

**Step 3:** Select the range D9:J18. Note that the selection should include the linked cell (D9), possible discount rates (E9:J9), possible growth rates (D10:D18), and the empty cells for the outputs (E10:J18).

The selection is shown in the following image.

	C	D	E	F	G	H	I	J	K
7									
8									
9									
	Discount Rate								
10	\$ 1,650,000	2.50%	3.00%	3.50%	4.00%	4.50%	5.00%		
11	12.50%								
12	13.50%								
13	14.50%								
14	15.50%								
15	16.50%								
16	17.50%								
17	18.50%								
18	19.50%								
19	20.50%								

**Step 4:** Click the “what-if analysis” drop-down (in the “data tools” or “forecast” group) of the Data tab. Select the option “data table.”

The screenshot shows the Microsoft Excel interface with the 'Data' tab selected. A red arrow points to the 'What-If Analysis' button in the 'Data Tools' group. Another red arrow points to the 'Data Table...' option in the dropdown menu. The worksheet contains financial data for 2018 and projected values for 2019. Below this, a data table is displayed with columns for 'Discount Rate' and rows for 'Growth Rate' from 12.50% to 20.50%.

	A	B	C	D	E	F	G	H	I	J
1	Year	Revenue								
2	2018	\$ 1,500,000								
3	Minimum Expected Growth Rate	12.00%								
4	Discount Rate	2.00%								
6	Projected Revenue for 2019	\$ 1,650,000								

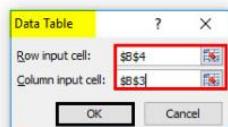
  

	Discount Rate						
	\$ 1,650,000	2.50%	3.00%	3.50%	4.00%	4.50%	5.00%
Growth Rate	12.50%						
10	13.50%						
11	14.50%						
12	15.50%						
13	16.50%						
14	17.50%						
15	18.50%						
16	19.50%						
17	20.50%						

**Step 5:** The “data table” window opens, as shown in the following image. **In the box of “row input cell,” select cell B4. In the box of “column input cell,” select cell B3.** The absolute references to cells B4 and B3 appear in the two boxes.

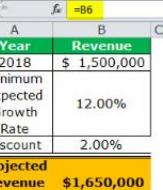
Cells B4 and B3 contain the minimum expected growth rate and the discount rate of the source dataset.

By making these selections, Excel is told that at a discount rate of 2% and a growth rate of 12%, the projected revenue is \$1,650,000. Therefore, our two-variable data table instructs Excel to calculate the projected revenues when the discount rates and growth rates vary from 2.5% to 5% and 12.5% to 20.5% respectively.



A screenshot of a Microsoft Excel spreadsheet and a 'Data Table' dialog box. The spreadsheet shows a table with columns 'Year' and 'Revenue'. Row 1 contains 'Year' and 'Revenue'. Row 2 contains '2018' and '\$ 1,500,000'. Rows 3 and 4 contain 'Minimum Expected Growth Rate' and 'Discount Rate' with values '12.00%' and '2.00%' respectively. Row 6 contains 'Projected Revenue for 2019' and '\$1,650,000'. The 'Data Table' dialog box is open, showing 'Row input cell: \$B\$4' and 'Column input cell: \$B\$3'. The dialog has 'OK' and 'Cancel' buttons. To the right of the dialog is a data table grid with 'Growth Rate' on the vertical axis (values: 12.50%, 13.50%, 14.50%, 15.50%, 16.50%, 17.50%, 18.50%, 19.50%, 20.50%) and 'Discount Rate' on the horizontal axis (values: 2.50%, 3.00%, 3.50%, 4.00%, 4.50%, 5.00%). The cell at the intersection of the first row and first column of the grid is highlighted in yellow.

**Step 6:** Click “Ok” in the “data table” window. The outputs appear in the range E10:J18, as shown in the following image.



A screenshot of the same Excel spreadsheet after running the data table. The data table results are now displayed in the range E10:J18. The columns are labeled 'Discount Rate' and the rows are labeled 'Growth Rate'. The values in the grid represent projected revenues for different combinations of growth and discount rates. The cell at the top-left of the grid, corresponding to the minimum growth rate (12.50%) and minimum discount rate (2.50%), is highlighted in yellow.

## Charts and Graphs:

Charts and graphs are powerful tools for visualizing data and identifying patterns or trends.

### How to do it:

- Select the data you want to visualize.
- Choose the appropriate chart type (e.g., bar chart, line chart, pie chart) based on your data and analysis goals.
- Customize the chart elements, labels, and titles to enhance clarity.
- Interpret the chart to draw insights from the data.

## Program 5

**Aim:** Cleaning Data with Text Functions: use of **UPPER** and **LOWER**, **TRIM** function, Concatenate.

**Data cleaning** includes removing unwanted characters from text.

A **text function** (an Excel string function) is a built-in formula for modifying, locating and extracting textual data in MS Excel. Text Functions can be used in several ways. They can return the number of characters in text strings, remove extra spaces and nonprintable characters from cells, return exact data within a string, change the case of text strings, and even combine text from other cells. Text functions allow you to create consistency throughout the workbook.

Here are the different types of text functions in Excel with examples:

Function	What It Does	Example Formulas
EXACT	Checks for duplicates. For example, EXACT(A2,A3) checks whether the values in second and third columns match.	=EXACT(A2,A3)
TRIM	Removes spaces from beginning and end of text.	=TRIM(A2:A300)
CLEAN	Removes all nonprintable characters from text.	=CLEAN(A2:A300)
SUBSTITUTE	Substitutes one or more instances of a given character with new character. For example, the formula on the right will substitute all instances of 1 with a 3 in cell C2.	=SUBSTITUTE(C2,"1","3")
REPLACE	Replaces characters in a specified position of a text string. For example, the formula on the right will replace the second character in cell C2 with "new." Replace only one character.	=REPLACE(C2, 2, 1, "new")
LEFT/RIGHT	Extracts a given number of characters from the left/right side of a text string. For example, LEFT("parking", 4) changes "parking" to "park."	=LEFT(A2,4) =RIGHT(A2, 4)
PROPER	Changes the first letter in each word to upper case. For example, PROPER("id") changes "id" to "Id."	=PROPER(A2)
LOWER/UPPER	Changes text to lower/upper case letters. For example, UPPER("id") changes "id" to "ID."	=LOWER(A2) =UPPER(A2)
CONCATENATE	Joins text from different cells into one cell. & " " adds space between the cells. For example, =CONCATENATE("John"& " ", "Smith") changes "John" and "Smith" in separate cells to "John Smith" in a single cell.	=CONCATENATE(A2& " ", B2)
ISBLANK	Identifies whether a cell is blank and returns a "True" or "False."	=ISBLANK(A2)
MIN/MAX	Identifies the lowest or highest value in a range of cells.	=MIN(A2:A300) =MAX(A2:A300)

### Result: UPPER and LOWER, TRIM function

	A	B	C	D	E
1	<b>Employee Name</b>	<b>Trim</b>	<b>Upper Case</b>	<b>Lower Case</b>	<b>Corrected Case</b>
2	bhagat singh	bhagat singh	BHAGAT SINGH	bhagat singh	Bhagat Singh
3	rabindranath tagore	rabindranath tagore	RABINDRANATH TAGORE	rabindranath tagore	Rabindranath Tagore
4	P V sindhu	P V sindhu	P V SINDHU	p v sindhu	P V Sindhu
5	sania mirza	sania mirza	SANIA MIRZA	sania mirza	Sania Mirza
6	sachin tendulkar	sachin tendulkar	SACHIN TENDULKAR	sachin tendulkar	Sachin Tendulkar
7	RAHUL DRAVID	RAHUL DRAVID	RAHUL DRAVID	rahul dravid	Rahul Dravid
8	VIRAT KOHLI	VIRAT KOHLI	VIRAT KOHLI	virat kohli	Virat Kohli
9	CRISTIANO RONALDO	CRISTIANO RONALDO	CRISTIANO RONALDO	cristiano ronaldo	Cristiano Ronaldo
10					

### Concatenate function

C1	f <sub>x</sub>	=CONCATENATE(A1, " ", B1)
A	B	C
1 MARY	KOM	MARY KOM
2		
3		

## Program 6

**Aim:** Cleaning Data Containing Date and Time Values: use of DATEVALUE function, DATEADD and DATEDIF, TIMEVALUE functions.

### **DATEVALUE Function:**

- **Purpose:** Convert a date string number that represents the date.
  - **Example:** DATEVALUE (“2024-02-05”)
  - **Usage:** Convert text representation of days into a format that can be used for calculations.

DATEVALUE (“2024-02-05”)  
45327

## **DATEADD Function:**

- **Purpose:** Convert a date string number that represents the date.
  - **Example:** DATEADD (day, 7, '2024-02-05')
  - **Usage:** Useful for adding or subtracting days, months, or years from a given date.

## Note:

- The DATEADD function can only be used in VBA code in Microsoft Excel.
  - For an alternative to the DATEADD function, we can use a combination of other functions such as DATE, YEAR, MONTH, and DAY along with arithmetic operations.

= DATE(YEAR

- `YEAR(start_date)` extracts the year from the start date.
  - `MONTH(start_date) + months_to_add` calculates the new month by adding the specified number of months to the original month of the start date.
  - `DAY(start_date)` extracts the day from the start date.

This approach effectively adds or subtracts months from the start date and returns the resulting date.

## DATEDIF Function:

- **Purpose:** Calculates the difference between two dates in years, months, or days.
  - **Example:** DATEDIF (A1, B1, "d")
  - **Usage:** Determine the duration between two dates, useful for age calculation or tracking time intervals.

### TIMEVALUE Function:

- **Purpose:** Convert a time string to a serial number that represents the time.
  - **Example:** TIMEVALUE (“10:10 AM”)
  - **Usage:** Convert text representation of times into a format that can be used for calculations.

Data	Result
10.10 AM	0.4375
12.30 PM	0.520833333
16.20.12	0.680694444
0.20.35	0.014293981

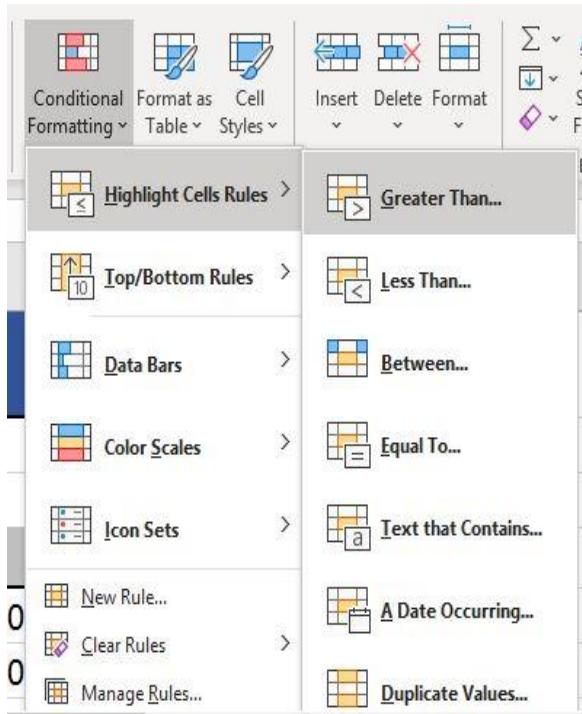
## Result:

## Program 7

**Aim:** *Conditional Formatting: formatting, parsing, and highlighting data in spreadsheets during data analysis.*

### Conditional Formatting:

Conditional formatting allows you to make data trends stand out visually.



### Parsing:

If you deal with data management, then you are likely familiar with the need to parse data. Parsing data refers to the process of breaking down large sets of data into smaller, more manageable pieces. When parsing data in Excel, you can easily separate and organize specific information into their respective categories. Parsing data also makes it possible to extract specific information, which can be useful for reporting or generating insights.

Data parsing in Excel is the process of splitting large sets of data into smaller parts or categories. At a basic level, it involves separating data values by a specific delimiter such as commas or semi-colons.

However, data parsing can also involve more complex operations such as extracting specific information from a larger data set or converting data into a different format. This can be useful for tasks such as data analysis or importing data into other software programs.

## Different Methods of Data Parsing in Excel

Excel provides different methods for parsing data. These include:

- Using Text to Columns
- Using Excel Formulas (LEFT, RIGHT,MID)

**Text to Columns** is a quick and easy way to split data into separate columns based on a delimiter, but it may not work well with complex data structures. **Excel Formulas** can be used to extract specific pieces of data from a cell, but they can be time-consuming to set up and may not be flexible enough for all data parsing needs. **VBA** allows for more advanced data parsing and automation, but requires programming knowledge. **Power Query** is a powerful tool for data transformation and can handle complex data structures, but may require more time to set up and learn.

## Step-by-Step Guide to Parse Data in Excel

1. Open the Excel file and select the cell range containing the data you wish to parse.
2. Click on the “Data” tab and select “Text to Columns” from the “Data Tools” group.
3. In the “Convert Text to Columns Wizard”, choose the delimiter you want to use for separating the data, whether it be commas, spaces, or tabs.
4. Preview your changes to ensure that the data is separated accordingly.
5. Click “Finish” and watch as the data is now separated into columns!

## Result:

	A	B	C	D	E
1					
2	<b>STUDENT DETAILS</b>	<b>FNAME</b>	<b>LNAME</b>	<b>DEPT</b>	<b>COLLEGE</b>
3	SHASHANK, CHOUDRY, AIML, RNSIT	SHASHANK	CHOUDRY	AIML	RNSIT
4	SANDESH, KUMAR, AIML, RNSIT	SANDESH	KUMAR	AIML	RNSIT
5	KIRAN, KUMAR, AIML, RNSIT	KIRAN	KUMAR	AIML	RNSIT
6	ANAGHA, KERUR, AIML, RNSIT	ANAGHA	KERUR	AIML	RNSIT
7	KOUSAR, FATHIMA, AIML, RNSIT	KOUSAR	FATHIMA	AIML	RNSIT
8					

	AIML RNSIT
	CSE RNSIT
	ISE RNSIT
	ECE RNSIT
	DS RNSIT
AIML	RNSIT
CSE	RNSIT
ISE	RNSIT
ECE	RNSIT
DS	RNSIT

Date Format	Text Format
11-Aug-18	11-08-2018
25-May-18	25-05-2018
08-Mar-18	08-03-2018
20-Dec-17	20-12-2017
03-Oct-17	03-10-2017
17-Jul-17	17-07-2017
30-Apr-17	30-04-2017

## Understanding the Basics of Excel Formulas for Data Parsing

Excel formulas can also be used to parse data, and the most commonly used function for this is the “LEFT”, “RIGHT” and “MID” functions. Let’s explore how these formulas work:

- The “LEFT” function extracts characters from the beginning of a text string.  
Syntax: LEFT (text, num\_chars)
- The “RIGHT” function extracts characters from the end of a text string.  
Syntax: RIGHT (text, num\_chars)
- The “MID” function extracts characters from the middle of a text string.  
Syntax: MID (text, start\_num, num\_chars)

### Result:

rashmi sandeep		
<b>left(E3,4)</b>	<b>right(E3,2)</b>	<b>mid(E3,1,6)</b>
rash	ep	rashmi

## Highlighting data:

- To highlight: Select a cell or group of cells > **Home** > **Cell Styles**, and select the color to use as the highlight.
- To highlight text: Select the text > **Font Color** and choose a color.
- To create a highlight style: **Home** > **Cell Styles** > **New Cell Style**. Enter a name, select **Format** > **Fill**, choose color > **OK**.

## Result:

The screenshot shows a Microsoft Excel spreadsheet titled "Experiment-7.xlsx - Microsoft Excel". The worksheet contains a table with columns labeled FNAME, LNAME, DEPT, and COLLEGE. The first row of data is highlighted with a light green background. The "Custom" Cell Styles dialog box is open, displaying various fill styles under the "Fill" tab. These styles include "Good, Bad and Neutral" (Normal, Bad, Good, Neutral), "Data and Model" (Calculation, Check Cell, Explanatory..., Input, Linked Cell, Note, Output, Warning Text), "Titles and Headings" (Heading 1, Heading 2, Heading 3, Heading 4, Title, Total), and "Themed Cell Styles" (Accent1 through Accent6). A preview window on the right shows the applied styles to a sample of cells in the worksheet.

## Program 8

**Aim: Working with Multiple Sheets:** work with multiple sheets within a workbook is crucial for organizing and managing data perform complex calculations and create comprehensive reports.

Working with multiple sheets within a workbook is indeed crucial for organizing, managing data, performing complex calculations, and creating comprehensive reports.

### 1. Sheet Navigation:

**Purpose:**

- Quickly moving between different sheets in a workbook.

**How to do it:**

- Look for sheet tabs at the bottom of the spreadsheet.
- Click on the sheet tab to switch between sheets.
- Use keyboard shortcuts (e.g., Ctrl + Page Up/Down in Excel) for faster navigation.

### 2. Sheet Renaming:

**Purpose:**

- Giving meaningful names to sheets for better organization.

**How to do it:**

- Right-click on the sheet tab.
- Select "Rename" and enter the desired sheet name.

### 3. Sheet Grouping:

**Purpose:**

- Performing actions on multiple sheets simultaneously.

**How to do it:**

- Hold down the Ctrl key and click on the sheet tabs you want to group.
- Right-click on one of the selected tabs and choose "Group".

### 4. Cell Referencing Between Sheets:

**Purpose:**

- Accessing data from one sheet to another.

**How to do it:**

- Use sheet references in formulas (e.g., ='Sheet2'!A1).
- Create 3D references for calculations across multiple sheets (e.g.,=SUM(Sheet1:Sheet3!A1)).

### 5. Consolidating Data:

**Purpose:**

- Aggregating data from multiple sheets into one.

**How to do it:**

- Use functions like **SUM**, **AVERAGE**, or **VLOOKUP** with references to different sheets.

## 6. Linking Sheets and Workbooks:

### Purpose:

- Creating relationships between sheets or workbooks.

### How to do it:

- Copy and paste data between sheets.
- Use formulas with external references to link to cells in other sheets or workbooks.

## 7. 3D Formulas:

### Purpose:

- Performing calculations that involve data from multiple sheets.

### How to do it:

- Use formulas that reference ranges across multiple sheets.

Example: =SUM (Sheet1:Sheet3!A1)

Example: =SUM (Sheet1:Sheet3!A1)

## 8. Creating Summary Sheets and Reports:

### Purpose:

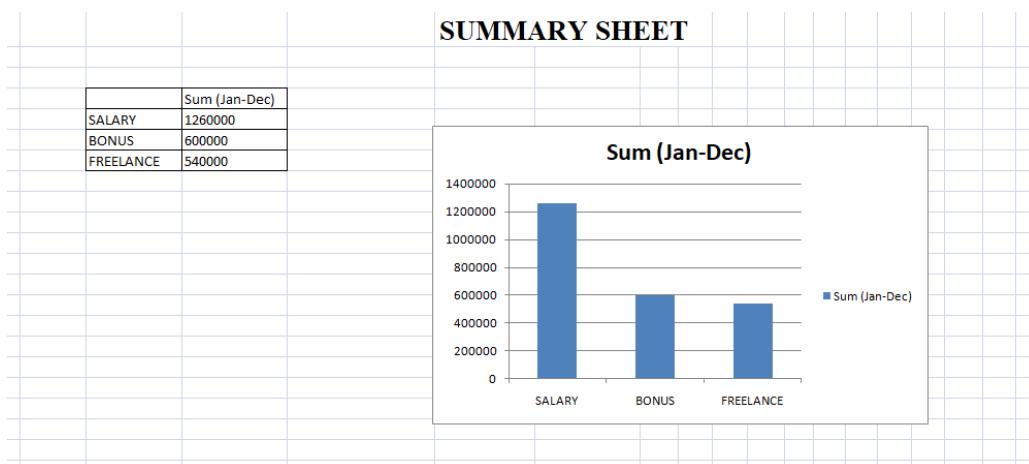
- Consolidating and presenting key information.

### How to do it:

- Use one sheet as a summary or report page, referencing data from other sheets.
- Create charts and visuals to represent consolidated data.

### Result:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	SUMMARY	JANUARY (?)



## Program 9

**Aim:** Create worksheet with following fields: **Empno**, **Ename**, **Basic Pay (BP)**, **Travelling Allowance (TA)**, **Dearness Allowance (DA)**, **House Rent Allowance (HRA)**, **Income Tax (IT)**, **Provident Fund (PF)**, **Net Pay (NP)**. Use appropriate formulas to calculate the above scenario. Analyze the data using appropriate chart and report the data.

Let's create a sample worksheet with the given fields: Empno, Ename, Basic Pay (BP), Travelling Allowance (TA), Dearness Allowance (DA), House Rent Allowance (HRA), Income Tax (IT), Provident Fund (PF), Net Pay (NP).

### 1. Create the Worksheet:

	A	B	C	D	E	F	G	H	I
1	Empno	Ename	Basic Pay	TA	DA	HRA	IT	PF	NP
2	101	John	5000	10%	8%	15%	5%	12%	
3									
4	102	Bob	5500	11%	7%	16%	4%	11%	

### 2. Formulas for Calculations:

- For Traveling Allowance (TA): =Basic Pay \* 10%
- For Dearness Allowance (DA): =Basic Pay \* 8%
- For House Rent Allowance (HRA): =Basic Pay \* 15%
- For Income Tax (IT): =Basic Pay \* 5%
- For Provident Fund (PF): =Basic Pay \* 12%

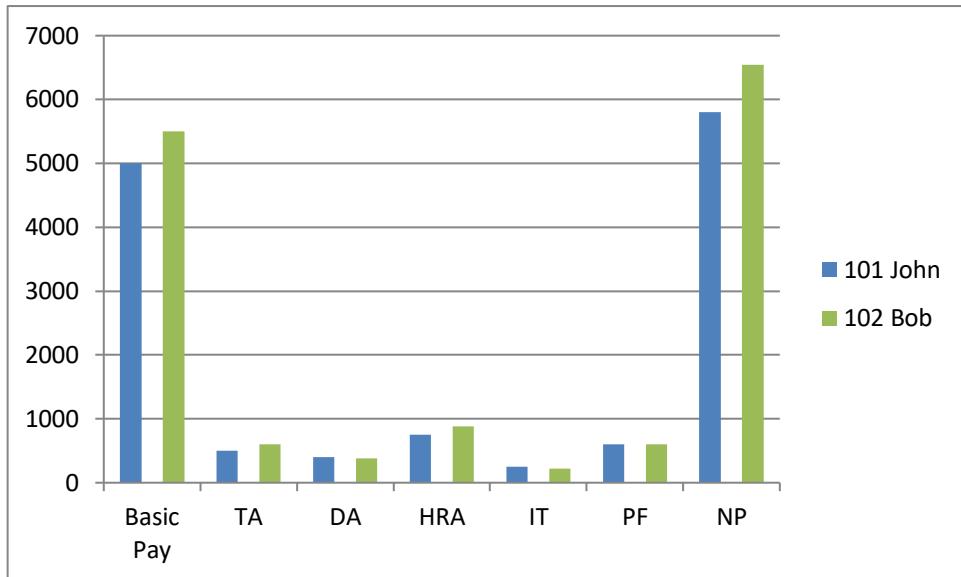
Empno	Ename	Basic Pay	TA	DA	HRA	IT	PF	NP
101	John	5000	500	400	750	250	600	5800
102	Bob	5500	605	385	880	220	605	6545

### 3. Net Pay (NP):

- For Net Pay (NP): =Basic Pay + TA + DA + HRA - IT - PF

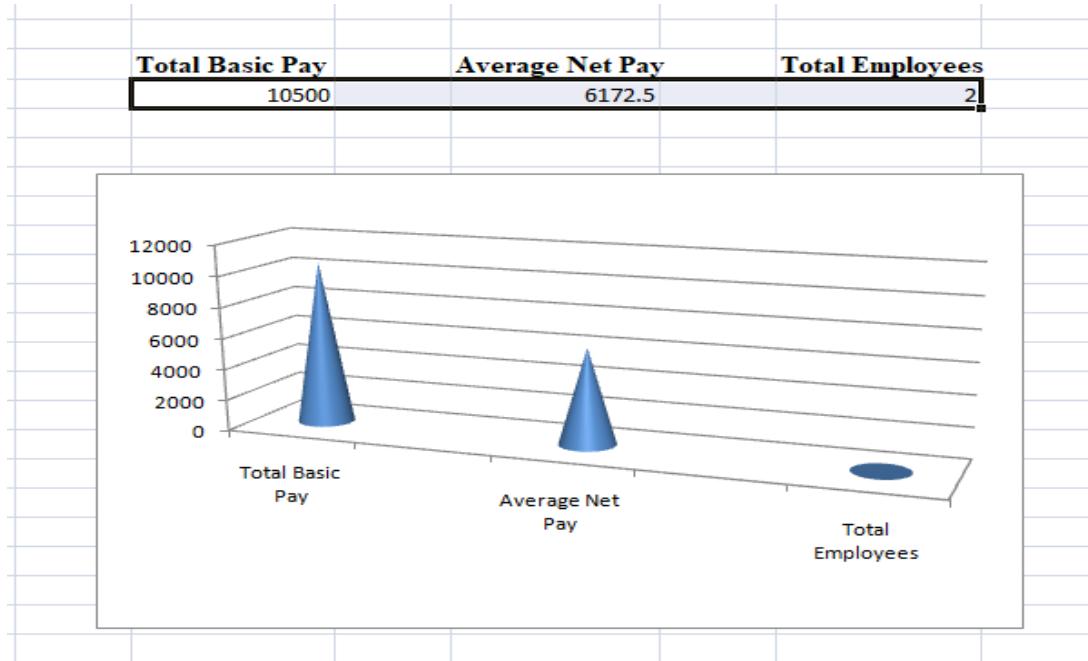
#### 4. Analyzing Data Using a Chart:

- Select the data range including headers.
- Go to the "Insert" tab and choose the desired chart type (e.g., a clustered column chart).
- Customize the chart as needed, including labels and titles



#### 5. Reporting the Data:

- Create a summary section to report key insights.
- Use functions like **SUM**, **AVERAGE**, or **COUNT** to analyze the data.
- Create charts or visuals to represent the data trends.



## Program 10

**Aim:** Create worksheet on Inventory Management: Sheet should contain Product code, Product name, Product type, MRP, Cost after % of discount, Date of purchase. Use appropriate formulas to calculate the above scenario. Analyse the data using appropriate chart and report the data.

Create a sample worksheet for inventory management with the given fields: Product code, Product name, Product type, MRP, Cost after % of discount, and Date of purchase.

Assuming that the Cost after % of discount is calculated based on the MRP and a discount percentage, we can set up the formulas accordingly. Here's an example:

### 1. Create the Worksheet:

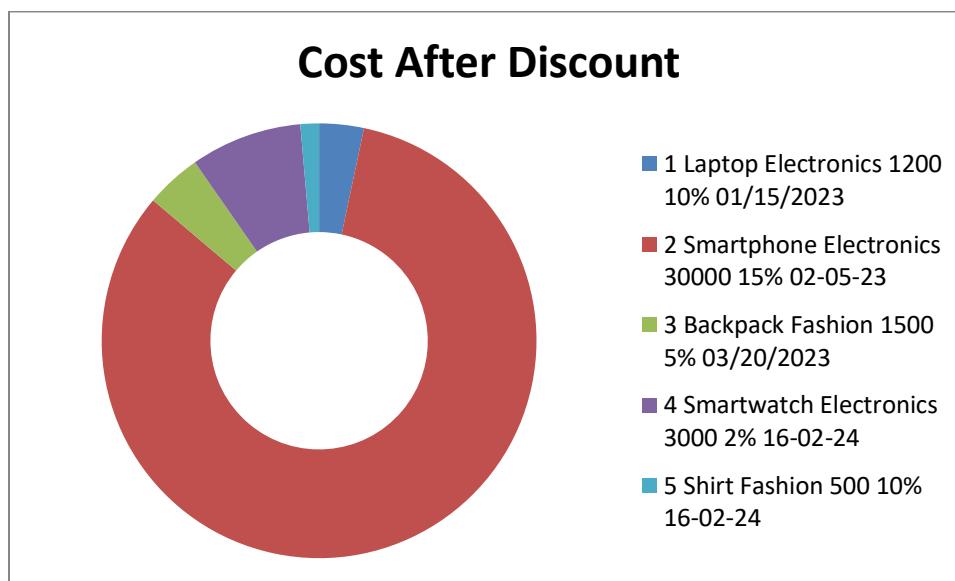
### 2. Formulas for Calculations:

- a. For Cost After Discount: =MRP - (MRP \* (Discount / 100))

	A	B	C	D	E	F	G
1	Product Code	Product Name	Product Type	MRP	Discount (%)	Date of Purchase	Cost After Discount
2	1	Laptop	Electronics	1200	10%	01/15/2023	1198.8
3	2	Smartphone	Electronics	30000	15%	02-05-23	29955
4	3	Backpack	Fashion	1500	5%	03/20/2023	1499.25
5	4	Smartwatch	Electronics	3000	2%	16-02-24	2999.4
6	5	Shirt	Fashion	500	10%	16-02-24	499.5

### 3. Analyzing Data Using a Chart:

- a. Select the data range including headers.
- b. Go to the "Insert" tab and choose the desired chart type.
- c. Customize the chart as needed, including labels and titles.

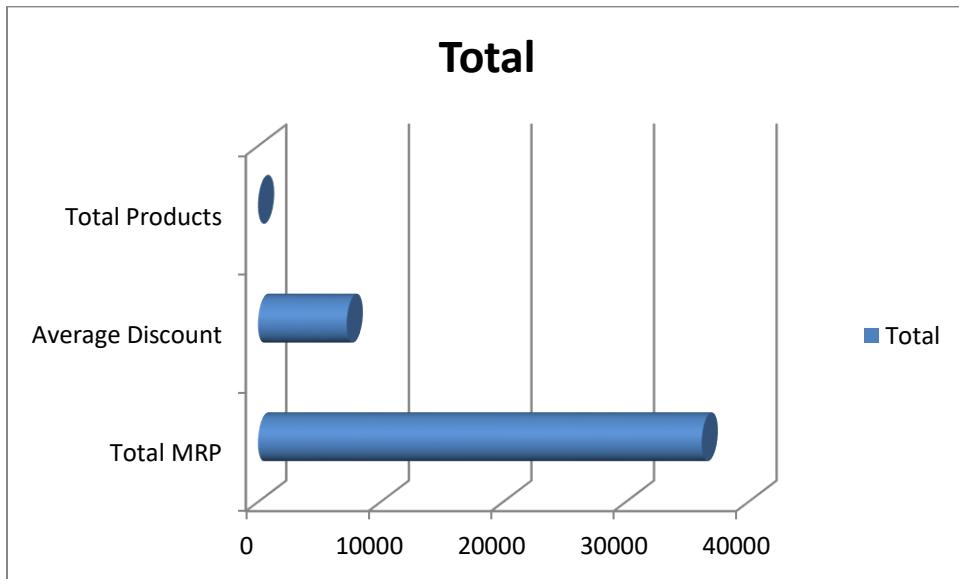


#### 4. Reporting the Data:

- a. Create a summary section to report key insights.
- b. Use functions like **SUM**, **AVERAGE**, or **COUNT** to analyze the data.
- c. Create charts or visuals to represent the data trends.

For instance, you might create a summary table like this:

Statistic	Total
Total MRP	=SUM(D2:D4)
Average Discount	=AVERAGE(E2:E4)
Total Products	=COUNT(A2:A4)



## Program 11

**Aim:** Create worksheet on Sales analysis of Merchandise Store: data consisting of Order ID, Customer ID, Gender, age, date of order, month, online platform, Category of product, size, quantity, amount, shipping city and other details. Use of formula to segregate different categories and perform a comparative study using pivot tables and different sort of charts

The data will consist of various details such as Order ID, Customer ID, Gender, Age, Date of Order, Month, Online Platform, Category of Product, Size, Quantity, Amount, Shipping City, and other relevant information.

### 1. Create the Worksheet:

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Order ID	Customer ID	Gender	Age	Date of Order	Month	Online Platform	Category of Product	Size	Quantity	Amount	Shipping City	Sales
2	1001	C001	Male	30	05-01-23	Jan	Website	Clothing	M	2	50	New York	333.9999
3	1002	C002	Female	25	10-02-23	Feb	App	Clothing	S	1	120	Los Angeles	391.91
4	1003	C003	Male	35	15-03-23	Mar	Website	Clothing	L	3	80	Chicago	51.38
5	1004	C004	Male	45	05-01-23	April	Website	Electronics	L	5	300	India	333.9999
6	1005	C005	Female	40	10-02-23	May	App	Clothing	S	6	444	Japan	391.91
7	1006	C006	Male	29	15-03-23	June	Website	Clothing	S	3	240	Sri lanka	51.38
8	1007	C007	Male	50	05-01-23	July	Website	Electronics	M	5	999	England	333.9999
9	1008	C008	Female	33	10-02-23	Aug	App	Clothing	S	7	200	France	391.91
10	1009	C009	Male	60	15-03-23	Sept	Website	Electronics	M	3	333	India	51.38

### 2. Use Formulas to Segregate Different Categories:

- Use formulas to categorize and analyze data. For example, you might use a formula to calculate the total amount per order, create age groups, or categorize products into different segments.

	=VLOOKUP(D2,\$F\$14:\$G\$24,2,1)													
1	Customer ID	Gender	Age	Date of Order	Month	Online Platform	Category of Product	Size	Quantity	Amount	Shipping City	Sales	Total	Age Groups
2	C008	Female	33	10-02-23	Aug	App	Clothing	S	7	200	France	391.91	1400	30-39
3	C002	Female	25	10-02-23	Feb	App	Clothing	S	1	120	Los Angeles	391.91	120	30-39
4	C005	Female	40	10-02-23	May	App	Clothing	S	6	444	Japan	391.91	2664	20-29
5	C004	Male	45	05-01-23	April	Website	Electronics	L	5	300	India	334	1500	40-49
6	C001	Male	30	05-01-23	Jan	Website	Clothing	M	2	50	New York	334	100	30-39
7	C007	Male	50	05-01-23	July	Website	Electronics	M	5	999	England	334	4995	50-59
8	C006	Male	29	15-03-23	June	Website	Clothing	S	3	240	Sri lanka	51.38	720	20-29
9	C003	Male	35	15-03-23	Mar	Website	Clothing	L	3	80	Chicago	51.38	240	30-39
10	C009	Male	60	15-03-23	Sept	Website	Electronics	M	3	333	India	51.38	999	60-69

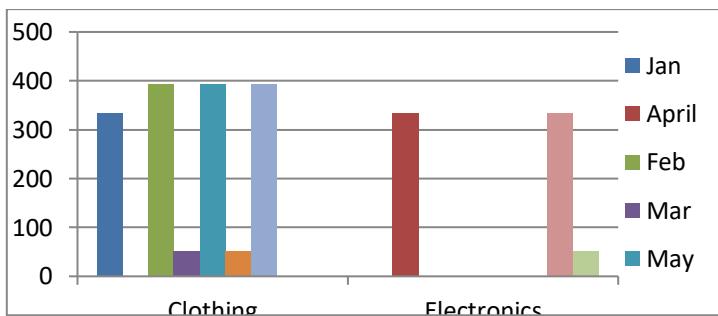
### 3. Perform a Comparative Study Using Pivot Tables:

- Create a pivot table to analyze and summarize the data based on different criteria.
- Drag and drop fields such as Month, Category of Product, Online Platform, etc., to rows and columns.
- Use functions like SUM, COUNT, or AVERAGE to summarize numerical data.

Row Labels	Column Labels										
	Sales	Jan	April	Feb	Mar	May	June	Aug	July	Sept	Grand Total
	Clothing	333.9999		391.91	51.38	391.91	51.38	391.91			1612.4899
	Electronics		333.9999						333.9999	51.38	719.3798
Grand Total	333.9999	333.9999	391.91	51.38	391.91	51.38	391.91	333.9999	51.38	2331.8697	

#### 4. Create Different Charts:

- Generate charts to visually represent the sales data.
- Create bar charts, pie charts, or line charts to show trends and comparisons.
- Customize the charts with appropriate labels and titles.



#### 5. Reporting the Data:

- Create a summary section to report key insights.
- Use functions like SUM, AVERAGE, or COUNT to analyze the data.
- Create charts or visuals to represent the data trends.

The screenshot displays a Microsoft Power BI dashboard. On the left, there is a bar chart titled 'Quantity' with categories 1 through 7. The legend identifies the bars by Customer ID: C001 (red), C002 (orange), C003 (green), C004 (purple), C005 (blue), C006 (yellow), C007 (light blue), and C009 (pink). The chart shows varying quantities across different categories. To the right of the chart is a 'Report Filter' pane containing a list of fields: Customer ID, Gender, Age, Date of Order, Month, Online Platform, Category of Product, Size, Quantity, Amount, Shipping City, and Sales. Below the filter pane is a 'Choose fields to add to report:' list where 'Age' is checked. At the bottom, there is a 'Drag fields between areas below:' section with 'Report Filter' and 'Customer ID' in the 'Column Labels' area, and 'Quantity' and 'Sum of Age' in the 'Values' area.

## Program 12

**Aim:** Generation of report & presentation using Autofilter &macro.

Generating reports and presentations using Autofilter and macros in Microsoft Excel can significantly enhance efficiency and presentation quality. Here's a step-by-step guide:

### 1. Data Preparation:

- Ensure your data is well-organized with headers.
- Include all relevant information for the report.

Sales Transactions					
	Restaurant Name	Rameswaram Cafe	Total Sales	10200	
	Total Branches	3	Total Amount	1200000	
	Sales Transactions Range	25-02-2024 To 28-02-2024			
9	S.no	Restaurant Name	Branch	Date	Total Sales Amount
10	1	Rameswaram Cafe	Jaya Nagar	25-02-2024	300 45000
11	2	Rameswaram Cafe	Brooke Field	25-02-2024	400 55000
12	3	Rameswaram Cafe	Indira Nagar	25-02-2024	500 65000
13		Rameswaram Cafe	Jaya Nagar	26-02-2024	600 75000
14		Rameswaram Cafe	Brooke Field	26-02-2024	700 85000
15		Rameswaram Cafe	Indira Nagar	26-02-2024	800 95000
16		Rameswaram Cafe	Jaya Nagar	27-02-2024	900 105000
17		Rameswaram Cafe	Brooke Field	27-02-2024	1000 115000
18		Rameswaram Cafe	Indira Nagar	27-02-2024	1100 125000
19		Rameswaram Cafe	Jaya Nagar	28-02-2024	1200 135000
20		Rameswaram Cafe	Brooke Field	28-02-2024	1300 145000
21		Rameswaram Cafe	Indira Nagar	28-02-2024	1400 155000

### 2. Autofilter:

- Select the data range.
- Go to the "Data" tab and click on "Filter" or use the shortcut (Ctrl + Shift + L).
- Autofilter arrows will appear on the header cells.

Sales Transactions					
	Restaurant Name	Rameswaram Cafe	Total Sales	10200	
	Total Branches	3	Total Amount	1200000	
	Sales Transactions Range	25-02-2024 To 28-02-2024			
9	S.no	Restaurant Name	Branch	Date	Total Sales Amount
10	1	Rameswaram Cafe	Jaya Nagar	25-02-2024	300 45000
11	2	Rameswaram Cafe	Brooke Field	25-02-2024	400 55000
12	3	Rameswaram Cafe	Indira Nagar	25-02-2024	500 65000
13		Rameswaram Cafe	Jaya Nagar	26-02-2024	600 75000
14		Rameswaram Cafe	Brooke Field	26-02-2024	700 85000
15		Rameswaram Cafe	Indira Nagar	26-02-2024	800 95000
16		Rameswaram Cafe	Jaya Nagar	27-02-2024	900 105000
17		Rameswaram Cafe	Brooke Field	27-02-2024	1000 115000
18		Rameswaram Cafe	Indira Nagar	27-02-2024	1100 125000
19		Rameswaram Cafe	Jaya Nagar	28-02-2024	1200 135000
20		Rameswaram Cafe	Brooke Field	28-02-2024	1300 145000
21		Rameswaram Cafe	Indira Nagar	28-02-2024	1400 155000

### 3. Filter Data for Report:

- Use Autofilter arrows to filter data based on specific criteria.
- For example,

In this example, we will try to filter data for the Branch `Brooke Field`.

#### 4. Create Report:

- Based on the filtered data, create a summary or detailed report in a separate sheet.
- Use formulas, pivot tables, or any other analysis tools.

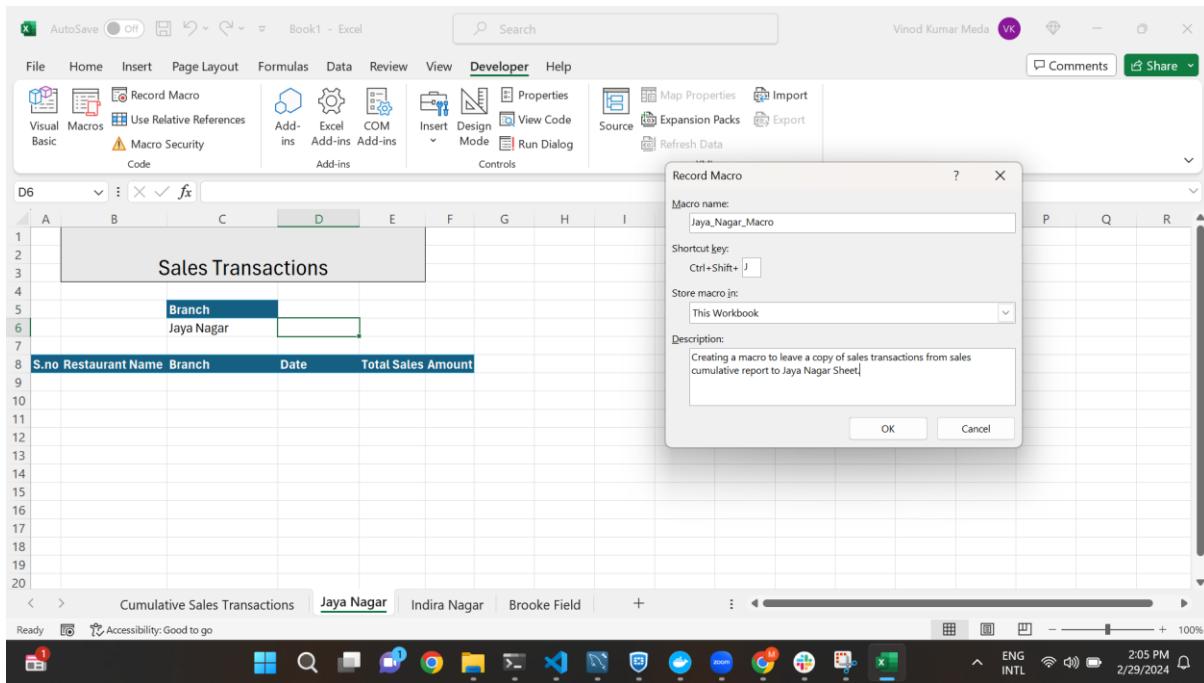
#### 5. Macro Recording:

- If you have repetitive tasks, consider recording a macro.
- Go to the "View" tab, click on "Macros," and then "Record Macro".
- Perform your tasks (e.g., applying filters, creating a report).
- Stop recording the macro.

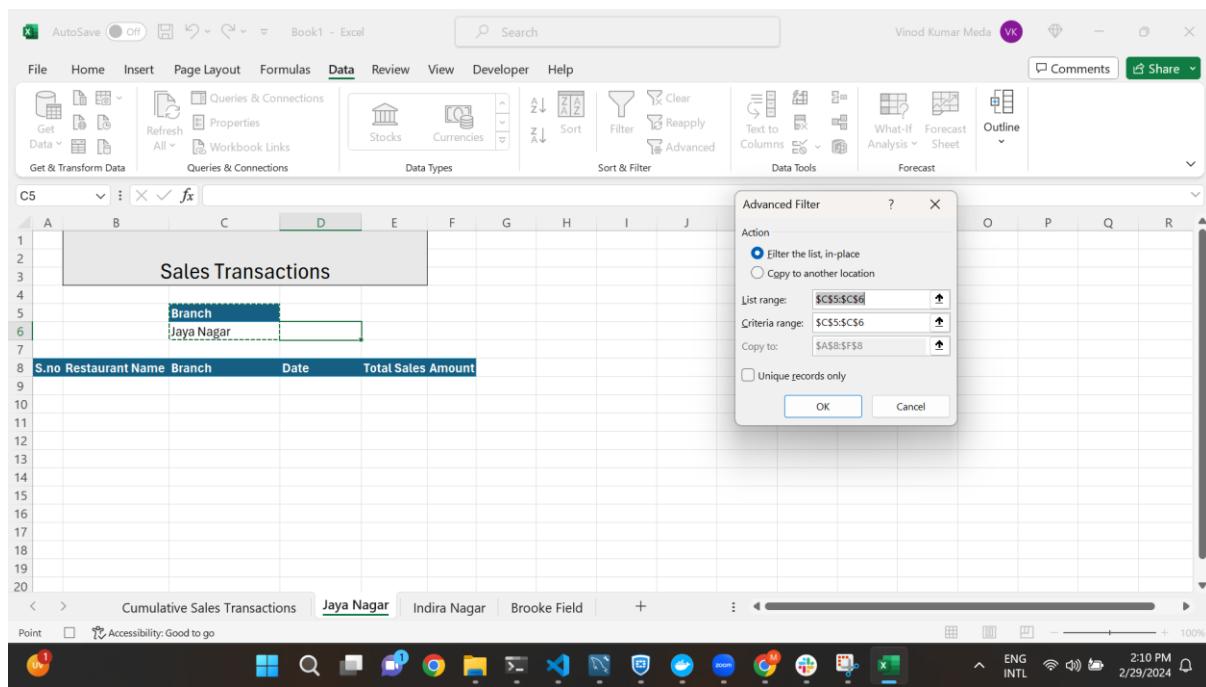
Steps to create a macro for Jaya Nagar:

##### 1. Click on the `Developer` menu option

## 2. Click on 'Record Macro'



3. Give a Macro name
4. Give shortcut key for macro
5. Choose Store Macro: This Workbook
6. Provide a macro description ( It is optional ).
7. Now apply Advanced Filters: Data -> Advanced Filters



## 8. Give List Range as Entire Data Set of Sales Summary

The screenshot shows an Excel spreadsheet titled "Sales Transactions". The data includes a header row and several rows of sales details. An "Advanced Filter" dialog box is open, with the "List range" set to "Table1[#All]" and the "Criteria range" set to "\$C\$5:\$C\$6". The "Action" dropdown is set to "Enter the list, in-place". The "OK" button is highlighted.

Sno	Restaurant Name	Branch	Date	Total Sales	Amount
1	Rameswaram Cafe	Jaya Nagar	25-02-2024	300	45000
2	Rameswaram Cafe	Brooke Field	25-02-2024	400	55000
3	Rameswaram Cafe	Indira Nagar	25-02-2024	500	65000
4	Rameswaram Cafe	Jaya Nagar	26-02-2024	600	75000
5	Rameswaram Cafe	Brooke Field	26-02-2024	700	85000
6	Rameswaram Cafe	Indira Nagar	26-02-2024	800	95000
7	Rameswaram Cafe	Jaya Nagar	27-02-2024	900	105000
8	Rameswaram Cafe	Brooke Field	27-02-2024	1000	115000
9	Rameswaram Cafe	Indira Nagar	27-02-2024	1100	125000
10	Rameswaram Cafe	Jaya Nagar	28-02-2024	1200	135000
11	Rameswaram Cafe	Brooke Field	28-02-2024	1300	145000
12	Rameswaram Cafe	Indira Nagar	28-02-2024	1400	155000

## 9. Give Criteria Range: Branch -> Jaya Nagar

The screenshot shows an Excel spreadsheet titled "Sales Transactions". The data includes a header row and several rows of sales details. An "Advanced Filter" dialog box is open, with the "List range" set to "Table1[#All]" and the "Criteria range" set to "Jaya Nagar!Criteria". The "Action" dropdown is set to "Enter the list, in-place". The "OK" button is highlighted.

S.no	Restaurant Name	Branch	Date	Total Sales	Amount
1	Rameswaram Cafe	Jaya Nagar	25-02-2024	300	45000
2	Rameswaram Cafe	Brooke Field	25-02-2024	400	55000
3	Rameswaram Cafe	Indira Nagar	25-02-2024	500	65000
4	Rameswaram Cafe	Jaya Nagar	26-02-2024	600	75000
5	Rameswaram Cafe	Brooke Field	26-02-2024	700	85000
6	Rameswaram Cafe	Indira Nagar	26-02-2024	800	95000
7	Rameswaram Cafe	Jaya Nagar	27-02-2024	900	105000
8	Rameswaram Cafe	Brooke Field	27-02-2024	1000	115000
9	Rameswaram Cafe	Indira Nagar	27-02-2024	1100	125000
10	Rameswaram Cafe	Jaya Nagar	28-02-2024	1200	135000
11	Rameswaram Cafe	Brooke Field	28-02-2024	1300	145000
12	Rameswaram Cafe	Indira Nagar	28-02-2024	1400	155000

10. Choose `Copy to another location` and provide Copy to value and click `ok`.

The screenshot shows the Microsoft Excel ribbon with the 'Data' tab selected. A context menu is open over a table titled 'Sales Transactions'. The 'Advanced Filter' option is chosen, opening a dialog box. In the 'Action' section, the radio button for 'Copy to another location' is selected. The 'List range' dropdown shows 'Table1[#All]'. The 'Criteria range' dropdown shows 'Jaya Nagar!Criteria'. The 'Copy to' dropdown shows 'Jaya Nagar!Extract'. The 'OK' button at the bottom left of the dialog box is highlighted with a blue border.

11. Finally Jaya Nagar sheet automatically filters respective branch sales transactions from the Sales Summary sheet.

The screenshot shows the Microsoft Excel ribbon with the 'Developer' tab selected. The 'Controls' group is visible under the 'Insert' tab. The worksheet contains the same 'Sales Transactions' table as the previous screenshot, but the data has been filtered to show only rows where the 'Branch' column is 'Jaya Nagar'. The 'OK' button in the Advanced Filter dialog box was likely clicked to apply this filter.

**12. Click `ok` and do `Stop Recording` under the Developer menu**

Now try to add a few more sales transactions for the Jaya Nagar branch in the Sales Summary Sheet and observe that Jaya Nagar branch-related sales transactions will not fill with respective branch transactions rows.

The screenshot shows the Microsoft Excel interface with the 'Developer' tab selected in the ribbon. A table titled 'Sales Transactions' is visible, showing data for Rameswaram Cafe. The table includes columns for S.no, Restaurant Name, Branch, Date, Total Sales, and Amount. The 'Cumulative Sales Transactions' ribbon tab is active. The status bar at the bottom right shows the date as 2/29/2024 and the time as 2:16 PM.

S.no	Restaurant Name	Branch	Date	Total Sales	Amount
1	Rameswaram Cafe	Jaya Nagar	25-02-2024	300	45000
2	Rameswaram Cafe	Brooke Field	25-02-2024	400	55000
3	Rameswaram Cafe	Indira Nagar	25-02-2024	500	65000
4	Rameswaram Cafe	Jaya Nagar	26-02-2024	600	75000
5	Rameswaram Cafe	Brooke Field	26-02-2024	700	85000
6	Rameswaram Cafe	Indira Nagar	26-02-2024	800	95000
7	Rameswaram Cafe	Jaya Nagar	27-02-2024	900	105000
8	Rameswaram Cafe	Brooke Field	27-02-2024	1000	115000
9	Rameswaram Cafe	Indira Nagar	27-02-2024	1100	125000
10	Rameswaram Cafe	Jaya Nagar	28-02-2024	1200	135000
11	Rameswaram Cafe	Brooke Field	28-02-2024	1300	145000
12	Rameswaram Cafe	Indira Nagar	28-02-2024	1400	155000
13	Rameswaram Cafe	Jaya Nagar	29-02-2024	1500	165000

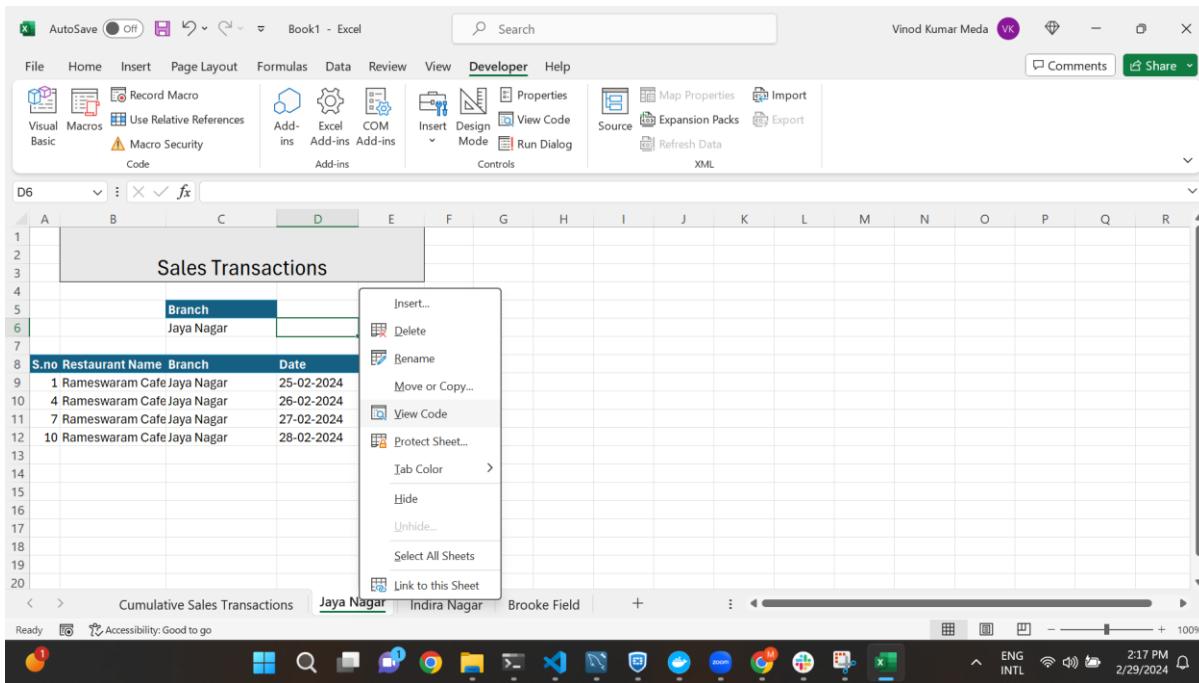
The screenshot shows the Microsoft Excel interface with the 'Developer' tab selected in the ribbon. A table titled 'Sales Transactions' is visible, showing data for Rameswaram Cafe. The table includes columns for S.no, Restaurant Name, Branch, Date, Total Sales, and Amount. The 'Cumulative Sales Transactions' ribbon tab is active. The status bar at the bottom right shows the date as 2/29/2024 and the time as 2:17 PM.

S.no	Restaurant Name	Branch	Date	Total Sales	Amount
1	Rameswaram Cafe	Jaya Nagar	25-02-2024	300	45000
2	Rameswaram Cafe	Jaya Nagar	26-02-2024	600	75000
3	Rameswaram Cafe	Jaya Nagar	27-02-2024	900	105000
4	Rameswaram Cafe	Jaya Nagar	28-02-2024	1200	135000

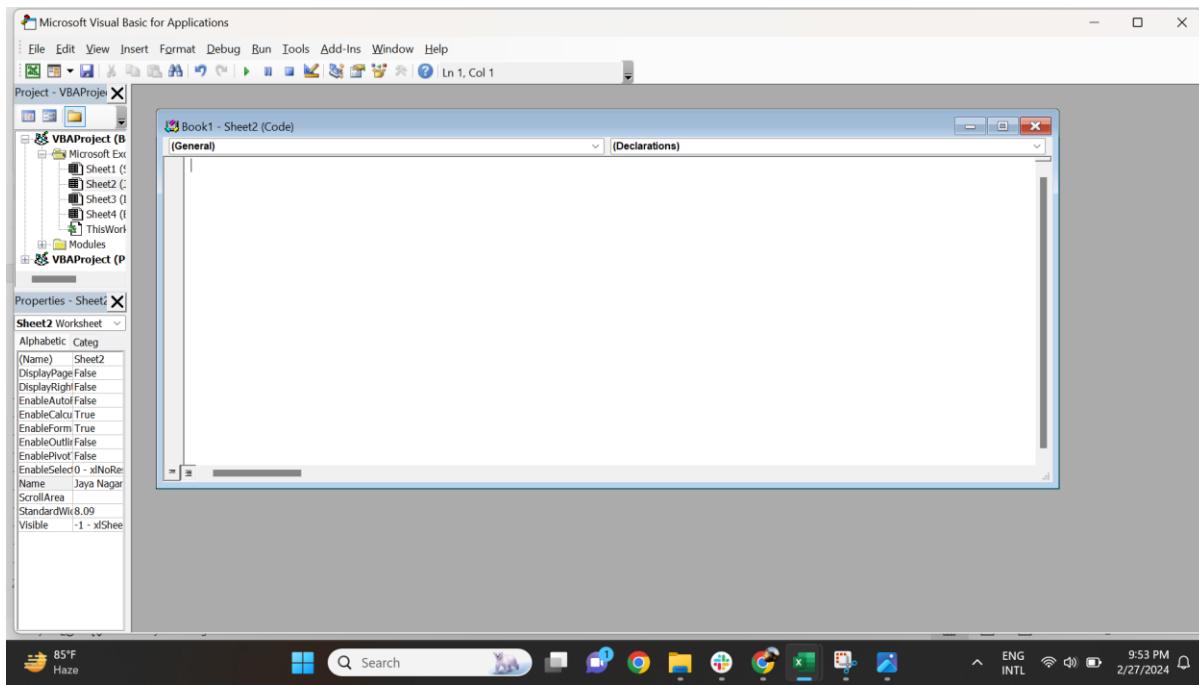
**Reason:** Jaya\_Nagar\_Macro is not running in the background

**Solution:** Need to run Jaya\_Nagar Macro in the background using VB Script and for that execute the below steps.

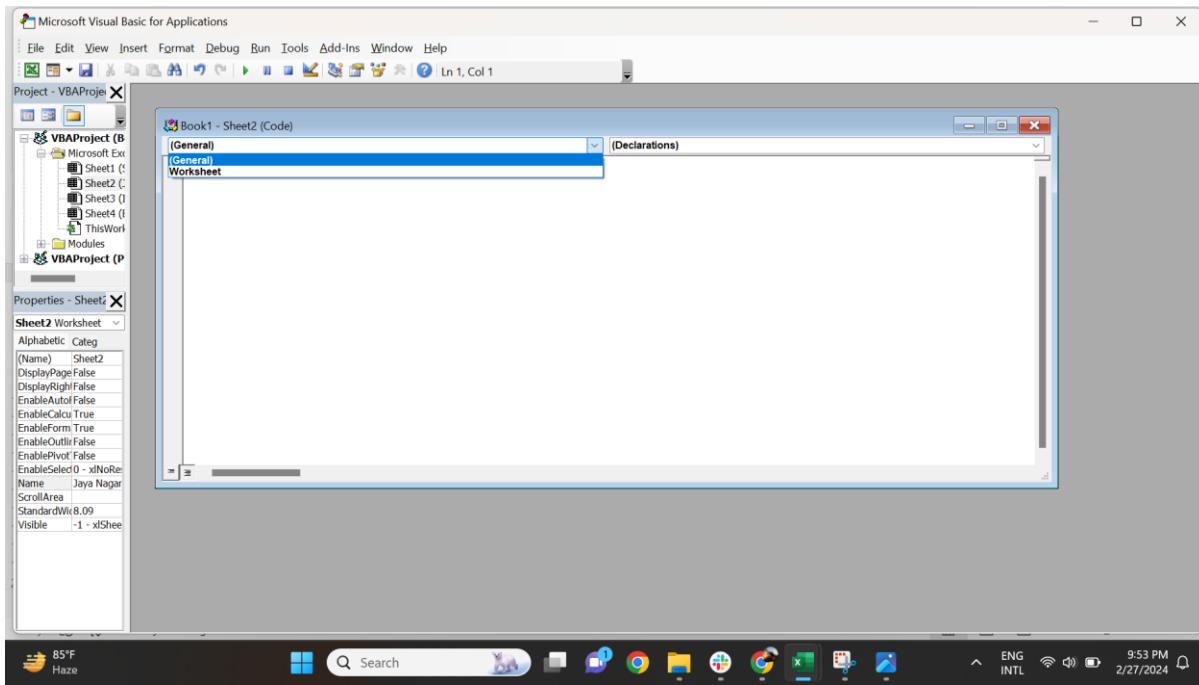
- Choose the Jaya Nagar sheet and click



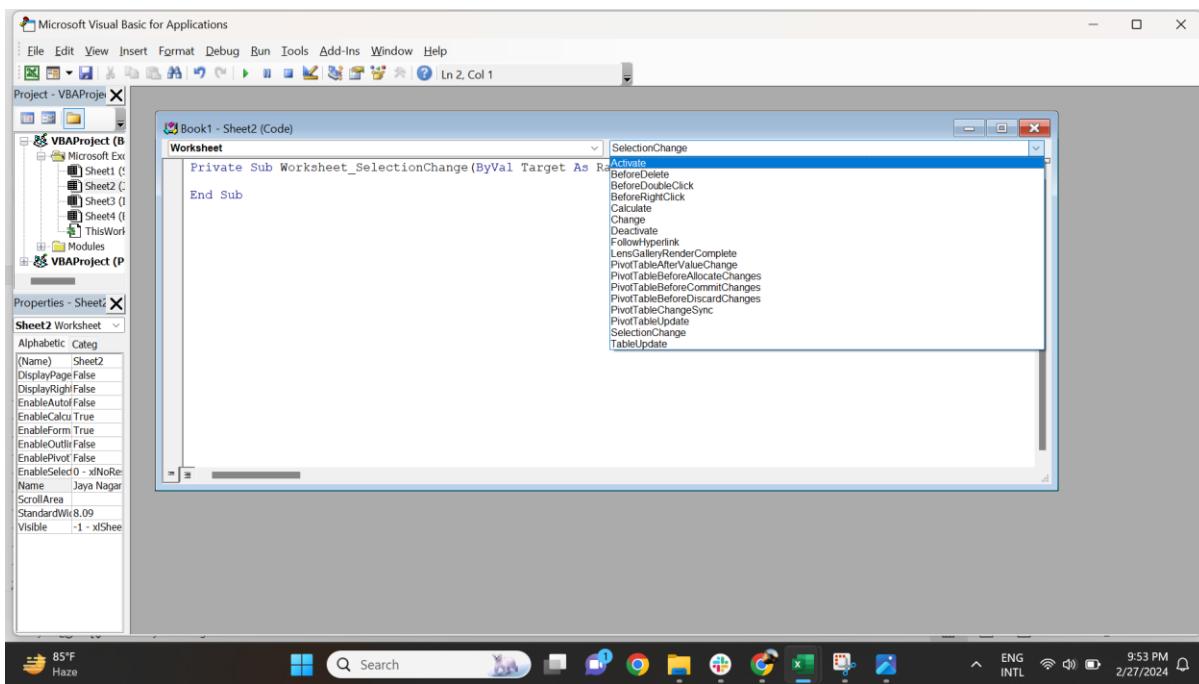
- Choose View Code option



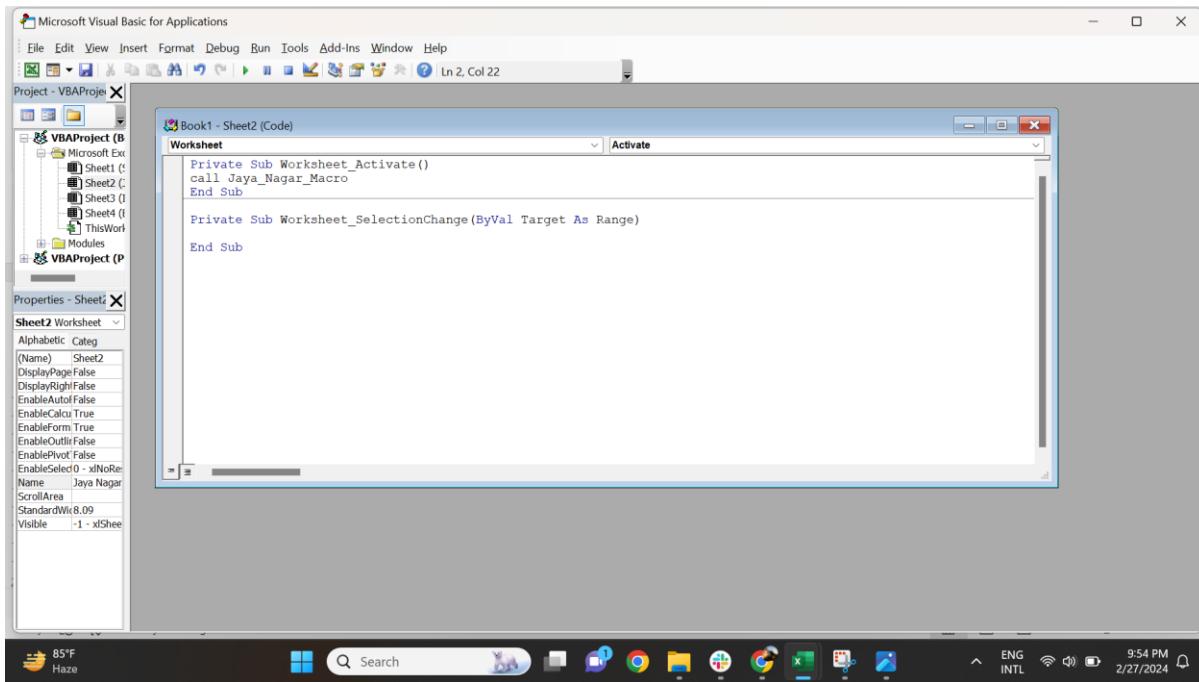
- Choose the `WorkSheet` option from the **General** dropdown



- Choose the `Activate` option from the `Declarations` dropdown



- Now call `Jaya\_Nagar\_Macro` by giving below command as mentioned in the screenshot



Now close the VB editor and again add a few more sales transactions for the Jaya Nagar branch and now observe the Jaya Nagar branch sheet like Jaya Nagar Sheet fills with Jaya Nagar branch-related sales transactions only.

**Final Output:** After running Jaya\_Nagar\_Macro in the background using VB Script

The screenshot shows a Microsoft Excel spreadsheet titled 'Book1 - Excel'. The ribbon is set to 'Developer'. The worksheet is titled 'Sales Transactions' and contains the following data:

S.no	Restaurant Name	Branch	Date	Total Sales	Amount
1	Rameswaram Cafe	Jaya Nagar	25-02-2024	300	45000
4	Rameswaram Cafe	Jaya Nagar	26-02-2024	600	75000
7	Rameswaram Cafe	Jaya Nagar	27-02-2024	900	105000
10	Rameswaram Cafe	Jaya Nagar	28-02-2024	1200	135000
13	Rameswaram Cafe	Jaya Nagar	29-02-2024	1500	165000

The 'Branch' column is highlighted in blue. The status bar at the bottom shows 'Cumulative Sales Transactions' and tabs for 'Jaya Nagar', 'Indira Nagar', and 'Brooke Field'. The taskbar at the bottom shows various application icons.

The same process needs to be repeated for other branches too.