

Data Analytics with Excel		<i>Semester</i>	3
<i>Course Code</i>	BCS358A	<i>CIE Marks</i>	50
<i>Teaching Hours/Week (L:T:P: S)</i>	0:0:2:0	<i>SEE Marks</i>	50
<i>Credits</i>	01	<i>Exam Hours</i>	100
<i>Examination type (SEE)</i>	Practical		

Course objectives:

- To Apply analysis techniques to datasets in Excel
- Learn how to use Pivot Tables and Pivot Charts to streamline your workflow in Excel
- Understand and Identify the principles of data analysis
- Become adept at using Excel functions and techniques for analysis
- Build presentation ready dashboards in Excel

Sl.NO	Experiments
1	Getting Started with Excel: Creation of spread sheets, Insertion of rows and columns, Drag & Fill, use of Aggregate functions.
2	Working with Data : Importing data, Data Entry & Manipulation, Sorting & Filtering.
3	Working with Data: Data Validation, Pivot Tables & Pivot Charts.
4	Data Analysis Process: Conditional Formatting, What-If Analysis, Data Tables, Charts & Graphs.
5	Cleaning Data with Text Functions: use of UPPER and LOWER, TRIM function, Concatenate.
6	Cleaning Data Containing Date and Time Values: use of DATEVALUE function, DATEADD and DATEDIF, TIMEVALUE functions.
7	Conditional Formatting: formatting, parsing, and highlighting data in spreadsheets during data analysis.
8	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.
9	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. Analyse the data using appropriate chart and report the data.
10	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.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation (CIE):

CIE marks for the practical course are **50 Marks**.

The split-up of CIE marks for record/ journal and test are in the ratio **60:40**.

- *Each experiment is to be evaluated for conduction with an observation sheet and record write-up. Rubrics for the evaluation of the journal/write-up for hardware/software experiments are designed by the faculty who is handling the laboratory session and are made known to students at the beginning of the practical session.*
- *Record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 10 marks.*
- *Total marks scored by the students are scaled down to **30 marks** (60% of maximum marks).*
- *Weightage to be given for neatness and submission of record/write-up on time.*
- *Department shall conduct a test of 100 marks after the completion of all the experiments listed in the syllabus.*
- *In a test, test write-up, conduction of experiment, acceptable result, and procedural knowledge will carry a weightage of 60% and the rest 40% for viva-voce.*
- *The suitable rubrics can be designed to evaluate each student's performance and learning ability.*
- *The marks scored shall be scaled down to **20 marks** (40% of the maximum marks).*

The Sum of scaled-down marks scored in the report write-up/journal and marks of a test is the

Semester End Evaluation (SEE):

- *SEE marks for the practical course are 50 Marks.*
- *SEE shall be conducted jointly by the two examiners of the same institute, examiners are appointed by the Head of the Institute.*
- *The examination schedule and names of examiners are informed to the university before the*

- All laboratory experiments are to be included for practical examination.
- (Rubrics) Breakup of marks and the instructions printed on the cover page of the answer script to be strictly adhered to by the examiners. OR based on the course requirement evaluation rubrics shall be decided jointly by examiners.
- Students can pick one question (experiment) from the questions lot prepared by the examiners jointly.
- Evaluation of test write-up/ conduction procedure and result/viva will be conducted jointly by examiners.

General rubrics suggested for SEE are mentioned here, writeup-20%, Conduction procedure and result in - 60%, Viva-voce 20% of maximum marks. SEE for practical shall be evaluated for 100 marks and scored marks shall be scaled down to 50 marks (however, based on course type, rubrics shall be decided by the examiners)

Change of experiment is allowed only once and 15% of Marks allotted to the procedure part are to be made zero.

The minimum duration of SEE is 02 hours

Suggested Learning Resources:

- **Berk & Carey** - Data Analysis with Microsoft® Excel: Updated for Office 2007®, Third Edition, © 2010 Brooks/Cole, Cengage Learning, ISBN-13: 978-0-495-39178-4
- **Wayne L. Winston** - Microsoft Excel 2019: Data Analysis And Business Modeling, PHI, ISBN: 9789389347180
- **Aryan Gupta** - Data Analysis in Excel: The Best Guide. (<https://www.simplilearn.com/tutorials/excel-tutorial/data-analysis-excel>)



K.S. INSTITUTE OF TECHNOLOGY, BANGALORE – 560109

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Course: Data Analytics with Excel, LABORATORY			
Type: PRACTICAL		Course Code: BCS358A	
No of Hours per week			
Number of lecture hours/week		Total/week	Total teaching hours
		2	24 hours
Marks			
Internal Assessment	Examination	Total	Credits
50	50	100	1

Aim/Objective of the Course:

- To Apply analysis techniques to datasets in Excel
- Learn how to use Pivot Tables and Pivot Charts to streamline your workflow in Excel
- Understand and Identify the principles of data analysis
- Become adept at using Excel functions and techniques for analysis
- Build presentation ready dashboards in Excel

Course Learning Outcomes:

After completing the course, students will be able to implement and evaluate different artificial intelligence algorithms in Python programming language.

CO1	Develop the use advanced functions and productivity tools to assist in developing worksheets.	Applying (K3)
CO2	Select Manipulate data lists using Outline and PivotTables.	Applying (K3)
CO3	Apply Use Consolidation to summarise and report results from multiple worksheets.	Applying (K3)
CO4	Apply the different Excel functions and techniques for analysis.	Applying (K3)
CO5	Evaluate Apply Macros and Autofilter to solve the given real world scenario	Applying (K3)

Assessment:**Type of test/examination: Written examination****Continuous Internal Evaluation (CIE): 50 Marks****Semester End Examination (SEE): 50 Marks**

Test duration: 2 hrs

Examination duration: 2 hrs

CO to PO Mapping**PO1: Science and Technology****PO2: Problem Analysis****PO3: Design & Development****PO4: Investigations of complex problems****PO5: Modern tool usage****PO6: Engineer & Society****PO7: Environment and Society****PO8: Ethics****PO9: Individual & Team Work****PO10: Communication****PO11: Project Management & Finance****PO12: Life long learning**

PSO1: Ability to apply the fundamental concepts of Artificial Intelligence and Machine Learning to design and develop solutions to multidisciplinary problems of social concern.

PSO2: Ability to use the inculcated experiential learning for research and development activities in compliance with National Education Policy.

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
BCS358A.1	-	-	3	-	3	-	-	-	3	-	-	-
BCS358A.2	-	-	3	-	3	-	-	-	3	-	-	-
BCS358A.3	-	-	3	-	3	-	-	-	3	-	-	-
BCS358A.4	-	-	3	-	3	-	-	-	3	-	-	-
BCS358A.5	-	-	3	-	3	-	-	-	3	-	-	-
BCS358A.7	-	-	3	-	3	-	-	-	3	-	-	-

CO-PSO Mapping

CO	PSO1	PSO2
BCS358A.1	3	1
BCS358A.2	3	1
BCS358A.3	3	1
BCS358A.4	3	1
BCS358A.5	3	1
BCS358A.7	3	1

3	Substantial (High) Correlation
2	Moderate (Medium) Correlation
1	Slight (Low) Correlation
-	No correlation



K. S. INSTITUTE OF TECHNOLOGY
DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING
LESSON PLAN 2024-25 ODD SEMESTER

COURSE INCHARGE**: Prof. USHASRI GUNTI****COURSE TYPE / CODE / TITLE****: PRACTICAL / BCS358A /**
Data Analytics with Excel**YEAR/ SEMESTER/SECTION****: II / III / 'A' section****BRANCH****: ARTIFICIAL INTELLIGENCE &**
MACHINE LEARNING

Sl. No.	Topic to be covered	Teaching Aid	Proposed Date
1	Introduction	Projector and Board	Batches A1: 20-08-2024 A2: 19-08-2024
2	Getting Started with Excel: Creation of spread sheets, Insertion of rows and columns, Drag & Fill, use of Aggregate functions.	Projector and Board	Batches A1: 27-08-2024 A2: 24-08-2024
3	Working with Data : Importing data, Data Entry & Manipulation, Sorting & Filtering.	Projector and Board	Batches A1: 31-08-2024 A2: 26-08-2024
4	Working with Data: Data Validation, Pivot Tables & Pivot Charts.	Projector and Board	Batches A1: 03-09-2024 A2: 02-09-2024
5	Data Analysis Process: Conditional Formatting, What-If Analysis, Data Tables, Charts & Graphs.	Projector and Board	Batches A1: 10-09-2024 A2: 09-09-2024
6	Cleaning Data with Text Functions: use of UPPER and LOWER, TRIM function, Concatenate.	Projector and Board	Batches A1: 17-09-2024 A2: 28-09-2024
7	Cleaning Data Containing Date and Time Values: use of DATEVALUE function, DATEADD and DATEDIF, TIMEVALUE functions.	Projector and Board	Batches A1: 01-10-2024 A2: 30-09-2024
8	Revision		Batches A1: 08-10-2024 A2: 07-10-2024
9	LAB TEST 1		Batches A1: 15-10-2024 A2: 14-10-2024
10	Conditional Formatting: formatting, parsing, and highlighting data in spreadsheets during data analysis.	Projector and Board	Batches A1: 22-10-2024 A2: 21-10-2024

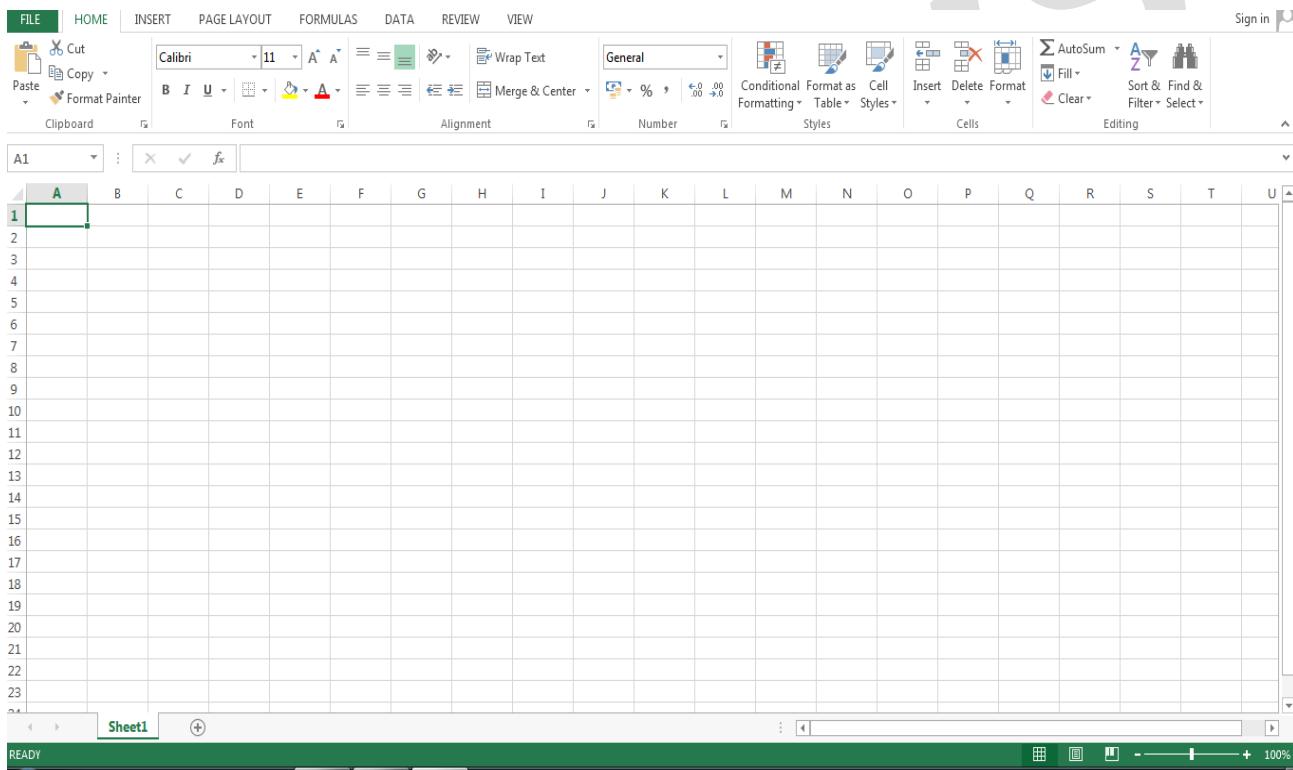
11	Working with Multiple Sheets: work with multiple sheets within a workbook is crucial for organizing and managing data, perform complex calculations and create comprehensive reports	Projector and Board	Batches A1: 29-10-2024 A2: 28-10-2024
12	Create worksheet with following fields: Empno, Ename, Basic 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. Analyse the data using appropriate chart and report the data.	Projector and Board	Batches A1: 12-11-2024 A2: 11-11-2024
13	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.	Projector and Board	Batches A1: 19-11-2024 A2: 23-11-2024
14	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.	Projector and Board	Batches A1: 26-11-2024 A2: 25-11-2024
15	Generation of report & presentation using Autofilter & macro.	Projector and Board	Batches A1: 03-12-2024 A2: 02-12-2024
16	Revision		Batches A1: 10-12-2024 A2: 09-12-2024
17	LAB TEST		Batches A1: 17-12-2024 A2: 16-12-2024

An Introduction to MS Excel

What is Microsoft Excel?

Microsoft Excel is a spreadsheet program used to record and analyze numerical and statistical data. Microsoft Excel provides multiple features to perform various operations like calculations, pivot tables, graph tools, macro programming, etc. It is compatible with multiple OS like Windows, macOS, Android and iOS. A Excel spreadsheet can be understood as a collection of columns and rows that form a table. Alphabetical letters are usually assigned to columns, and numbers are usually assigned to rows. The point where a column and a row meet is called a cell. The address of a cell is given by the letter representing the column and the number representing a row.

MS Excel is a spreadsheet program where one can record data in the form of tables. It is easy to analyze data in an Excel spreadsheet. The image given below represents how an Excel spreadsheet looks like:



How to open MS Excel?

To open MS Excel on your computer, follow the steps given below:

- Click on Start
- Then All Programs
- Next step is to click on MS Office
- Then finally, choose the MS-Excel option

Alternatively, you can also click on the Start button and type MS Excel in the search option available.

What is a cell?

A spreadsheet is in the form of a table comprising rows and columns. The rectangular box at the intersection point between rows and columns forms a cell.

Understanding the worksheet (Rows and Columns, Sheets, Workbooks)

A worksheet is a collection of rows and columns. When a row and a column meet, they form a cell. Cells are used to record data. Each cell is uniquely identified using a cell address. Columns are usually labelled with letters while rows are usually numbers.

A workbook is a collection of worksheets. By default, a workbook has three cells in Excel. You can delete or add more sheets to suit your requirements. By default, the sheets are named Sheet1, Sheet2 and so on and so forth. You can rename the sheet names to more meaningful names i.e. Daily Expenses, Monthly Budget, etc.

Features of MS Excel

Various editing and formatting can be done on an Excel spreadsheet. Discussed below are the various features of MS Excel.

The image below shows the composition of features in MS Excel:

- Home
Comprises options like font size, font styles, font colour, background colour, alignment, formatting options and styles, insertion and deletion of cells and editing options.
- ─ Insert
Comprises options like table format and style, inserting images and figures, adding graphs, charts and sparklines, header and footer option, equation and symbols.
- ─ Page Layout
Themes, orientation and page setup options are available under the page layout option.
- ─ Formulas
Since tables with a large amount of data can be created in MS excel, under this feature, you can add formulas to your table and get quicker solutions.
- ─ Data
Adding external data (from the web), filtering options and data tools are available under this category.
- ─ Review
Proof reading can be done for an excel sheet (like spell check) in the review category and a reader can add comments in this part.
- ─ View
Different views in which we want the spreadsheet to be displayed can be edited here. Options to zoom in and out and pane arrangement are available under this category.

Ms-Excel shortcuts:

1. **Ctrl+N:** To open a new workbook.
2. **Ctrl+O:** To open a saved workbook.
3. **Ctrl+S:** To save a workbook.
4. **Ctrl+C:** To copy the selected cells.
5. **Ctrl+V:** To paste the copied cells.
6. **Ctrl+X:** To cut the selected cells.
7. **Ctrl+W:** To close the workbook.
8. **Delete:** To remove all the contents from the cell.
9. **Ctrl+P:** To print the workbook.
10. **Ctrl+Z:** To undo.

Benefits of Using MS Excel

MS Excel is widely used for various purposes because the data is easy to save, and information can be added and removed without any discomfort and less hard work.

Given below are a few important benefits of using MS Excel:

- **Easy To Store Data:** Since there is no limit to the amount of information that can be saved in a spreadsheet, MS Excel is widely used to save data or to analyse data. Filtering information in Excel is easy and convenient.
- **Easy To Recover Data:** If the information is written on a piece of paper, finding it may take longer, however, this is not the case with excel spreadsheets. Finding and recovering data is easy.
- **Application of Mathematical Formulas:** Doing calculations has become easier and less time-taking with the formulas option in MS excel
- **More Secure:** These spreadsheets can be password secured in a laptop or personal computer and the probability of losing them is way lesser in comparison to data written in registers or piece of paper.
- **Data at One Place:** Earlier, data was to be kept in different files and registers when the paperwork was done. Now, this has become convenient as more than one worksheet can be added in a single MS Excel file.
- **Neater and Clearer Visibility of Information:** When the data is saved in the form of a table, analyzing becomes easier. Thus, information in a spreadsheet is more readable and understandable.

Applications of MS Excel:

- Data Entry and Storage
- Performing Calculations
- Data Analysis and Interpretation
- Reporting and Visualizations
- Accounting and Budgeting

- Collection and Verification of Business Data
- Calendars and Schedules
- Administrative and Managerial Duties
- Forecasting
- Automating Repetitive Tasks

Experiment No:1

Aim:

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

1. 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 ≥ 35 ,
- Distinction if average ≥ 70 ,
- First class if average ≥ 60 but < 70 ,
- Second class if average ≥ 50 but < 60 ,
- Third class if average ≥ 35 and but < 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

- **Step 1: Typing Student database in Excel 2007**

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

	A	B	C	D	E	F	G	H	I	J
1	Name Of Student	ADE	DS	Maths	CO	UHV	Total	Average	P/F	Grade
2	Kiran Kumar V	90	92	94	93	97				
3	Manikandan R	91	94	97	98	99				
4	Kishore Pruthvi	90	91	94	93	96				
5	Lohan V	92	99	94	90	93				
6	Meghanath	90	92	91	90	99				
7	Manikanth	92	93	96	97	93				
8	Rahul R	99	93	95	98	97				
9										

- Step2:To find Total Marks of Student

To find the total marks of a student click on the cell “G2” and type the following formula

 $=SUM(B2:F2)$

To find the total marks for the remaining students select “G2” cell and drag down to the remaining students.

	A	B	C	D	E	F	G
1	Name Of Student	ADE	DS	Maths	CO	UHV	Total
2	Kiran Kumar V	90	92	94	93	97	466
3	Manikandan R	91	94	97	98	99	479
4	Kishore Pruthvi	90	91	94	93	96	464
5	Lohan V	92	99	94	90	93	468
6	Meghanath	90	92	91	90	99	462
7	Manikanth	92	93	96	97	93	471
8	Rahul R	99	93	95	98	97	

- Step3:To find Average marks

To find the average marks of a student click on the cell “H2” and type the following formula

 $=G2/500*100$

To find the average marks for the remaining students select “H2” cell and drag down to all the students.

	A	B	C	D	E	F	G	H	I
1	Name Of Student	ADE	DS	Maths	CO	UHV	Total	Average	Grade
2	Kiran Kumar V	90	92	94	93	97	466	93.2	
3	Manikandan R	91	94	97	98	99	479	95.8	
4	Kishore Pruthvi	90	91	94	93	96	464	92.8	
5	Lohan V	92	99	94	90	93	468		
6	Meghanath	90	92	91	90	99	462		
7	Manikanth	92	93	96	97	93	471		
8	Rahul R	99	93	95	98	97	482		
9									

- Step4: To Check Pass or Fail

To check whether the student is Pass or Fail select the cell “I2” and type the following formula

```
=IF(AND(B2>=35,C2>=35,D2>=35,E2>=35,F2>=35),"Pass","Fail")
```

To check the remaining students are Pass/Fail select the cell “I2” and drag down to all the students

	A	B	C	D	E	F	G	H	I	J
1	Name Of Student	ADE	DS	Maths	CO	UHV	Total	Average	P/F	
2	Kiran Kumar V	90	92	94	93	97	466	93.2	Pass	
3	Manikandan R	91	94	97	98	99	479	95.8	Pass	
4	Kishore Pruthvi	90	91	94	93	96	464	92.8	Pass	
5	Lohan V	92	99	94	90	93	468	93.6	Pass	
6	Meghanath	90	92	91	90	99	462	92.4	Pass	
7	Manikanth	92	93	96	97	93	471	94.2	Pass	
8	Rahul R	99	93	95	98	97	482	96.4	Pass	
9										
10										

- Step5: To find Grade

To find the grade of a student click on the cell “J2” and type the following formula

```
=IF(AND(B2>=35,C2>=35,D2>=35,E2>=35,F2>=35),IF(H2>=75,"Distinction",IF(H2>=65,"First Class",IF(H2>=50,"Second Class",IF(H2>=35,"Third Class"))),"Fail"))
```

To find the grade 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	Name Of Student	ADE	DS	Maths	CO	UHV	Total	Average	P/F	Grade
2	Kiran Kumar V		90	92	94	93	97	466	93.2	Pass
3	Manikandan R		91	94	97	98	99	479	95.8	Pass
4	Kishore Pruthvi		90	91	94	93	96	464	92.8	Pass
5	Lohan V		92	99	94	90	93	468	93.6	Pass
6	Meghanath		90	92	91	90	99	462	92.4	Pass
7	Manikanth		92	93	96	97	93	471	94.2	Pass
8	Rahul R		99	93	95	98	97	482	96.4	Pass
9										

Finally we get the following student database with total, average and grade.

Output:

	A	B	C	D	E	F	G	H	I	J
1	Name Of Student	ADE	DS	Maths	CO	UHV	Total	Average	P/F	Grade
2	Kiran Kumar V		90	92	94	93	97	466	93.2	Pass
3	Manikandan R		91	94	97	98	99	479	95.8	Pass
4	Kishore Pruthvi		90	91	94	93	96	464	92.8	Pass
5	Lohan V		92	99	94	90	93	468	93.6	Pass
6	Meghanath		90	92	91	90	99	462	92.4	Pass
7	Manikanth		92	93	96	97	93	471	94.2	Pass
8	Rahul R		99	93	95	98	97	482	96.4	Pass

Experiment No:2

Aim:

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

Microsoft Excel is a powerful tool for managing and analyzing data. Whether you are dealing with a large dataset or a simple list, Excel offers various features for importing data, entering information, manipulating content, sorting, and filtering.

Importing Data:

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

Step 1: Open Excel and Navigate to Data Import Open in

g Excel:

Start by launching Microsoft Excel on your computer.

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).

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.

Data Entry and Manipulation:

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

Step 2: Data Entry and Basic Manipulation Entering Data:

ta:

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.

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 wider 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.

Sorting Data:

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

Step 3: Sorting Data

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."

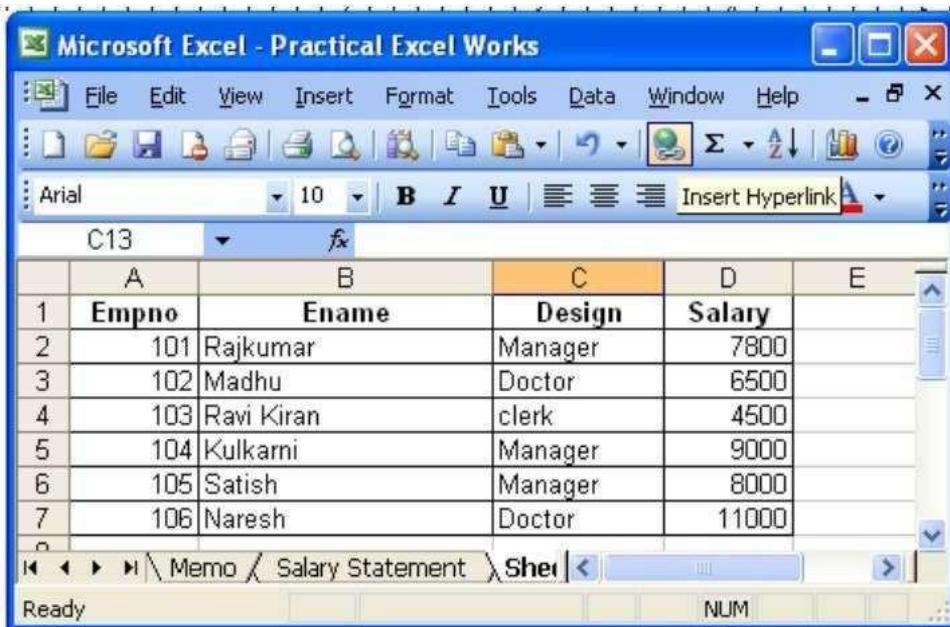
Complex Sorting:

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:

Steps: 1. Select data on list to be sorted.



A screenshot of Microsoft Excel showing a table of employee data. The table has columns labeled A, B, C, D, and E. Column A contains row numbers 1 through 7. Column B contains 'Empno' and employee names: 101 Rajkumar, 102 Madhu, 103 Ravi Kiran, 104 Kulkarni, 105 Satish, 106 Naresh. Column C contains 'Design' and job titles: Manager, Doctor, clerk, Manager, Manager, Doctor. Column D contains 'Salary' values: 7800, 6500, 4500, 9000, 8000, 11000. The Excel interface includes a toolbar, menu bar, and ribbon. The status bar at the bottom shows 'Ready'.

	A	B	C	D	E
1	Empno	Ename	Design	Salary	
2	101	Rajkumar	Manager	7800	
3	102	Madhu	Doctor	6500	
4	103	Ravi Kiran	clerk	4500	
5	104	Kulkarni	Manager	9000	
6	105	Satish	Manager	8000	
7	106	Naresh	Doctor	11000	

For example salary in the above figure.

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

3. Select the ascending and descending option in the Sort by section



4. Click the OK button

Filtering Data:

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

Step 4: Filtering Data 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 the arrows to filter data based on specific criteria.

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.

2. Prepare a salary statement for the following information and plot a graph

SLNO	EMPNAME	BASICPAY
------	---------	----------

1	RAMA	10000
2	MANU	15000
3	SASH	11000
4	HANU	10000
5	SITA	9000

I. Using MS-Excel calculate the following

- a. DA is 3% of basic
- b. HRA is 5% of basic
- c. Tax is 5% of Gross

II. Find maximum and minimum of Basic pay

III. Count the number of employees where net salary is more than 10,000

IV. Sort the data on the basis of employee name in ascending order

V. Plot the column graph by taking employee name on x-axis and net salary on y-axis

VI. Apply custom filter and display the emp names for whom the basic pay ≥ 10000

SOLUTION:

1. Type the text i.e. "EMPLOYEE SALARY STATEMENT" in the cell from "A1 to H1" using the merge and center button
2. Type the SLNO, EMPNAME, BASICPAY, DA, HRA, GROSS, TAX, NETSALARY in A2, B2, C2, D2, E2, F2, G2, H2 respectively
3. Put the data for SLNO, EMPNAME, BASICPAY
4. Calculation for

$$DA = C3 * 3\%$$

$$HRA = C3 * 5\%$$

$$GROSS = C3 + D3 + E3$$

TAX=F3*5%

NETSLARY=F3-G3

5. Calculation for

MAXIMUM=max(C3:C8)

MINIMUM = min(C3:C8)

COUNT=countif(C3:C8,">=10000")

6. For Sort

Selectdatarange->Clickdatamenu->Sort->Sortby->EmpName->Sorton-> Values -> Order

-> A to Z

7. For Graph

Selectdatarange->Clickinsertmenu ->Chart->Select columnchart->OK

8. ForFiltering

ApplyfilterselectingBasicpay,then->clickNumberfilter->Selectgreaterthanandequalto->enter10000

→ ClickOK

EMPLOYEES SALARY STATEMENT							
SL NO	EMP NAME	BASIC PAY	DA	HRA	GROSS PAY	TAX	NET SALARY
1	RAMA	10000	300	500	10800	540	10260
2	MANJU	15000	450	750	16200	810	15390
3	SASH	11000	330	550	11880	594	11286
4	HANU	10000	300	500	10800	540	10260
5	SITA	9000	270	450	9720	486	9234
6	BHARATH	12000	360	600	12960	648	12312

SL NO	EMP NAME	BASIC PAY	MAX(BASIC PAY)	MIN(BASIC PAY)	COUNT(BPAY>=10000)
1	BHARATH	12000	15000	9000	5
2	HANU	10000			
3	MANJU	15000			
4	RAMA	10000			
5	SASH	11000			
6	SITA	9000			

SL NO	EMP NAME	BASIC PAY	DA	HRA	GROSS PAY	TAX	NET SALARY
1	RAMA	10000	300	500	10800	540	10260
2	MANJU	15000	450	750	16200	810	15390
3	SASH	11000	330	550	11880	594	11286
4	HANU	10000	300	500	10800	540	10260
5	BHARATH	12000	360	600	12960	648	12312

Experiment No:3

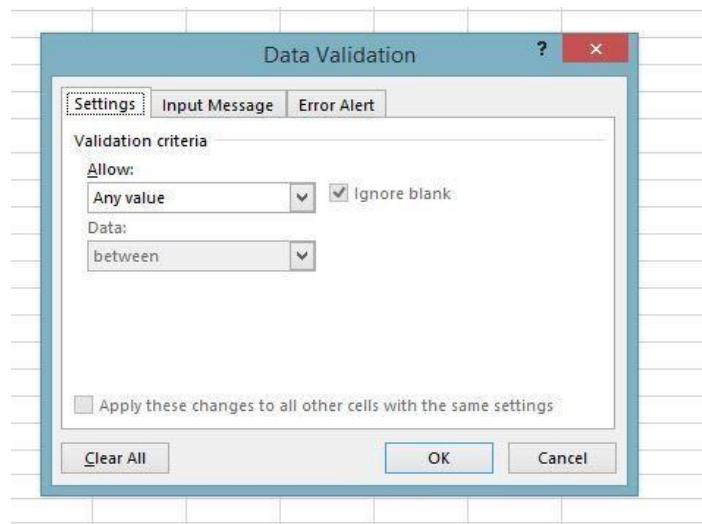
3. Working with Data: Data Validation, Pivot Tables & Pivot Charts.

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.

What Is Data Validation in Excel?

Data validation in Excel is a technique that restricts user input in a [worksheet](#). It is often used to limit user entry.



Settings Tab

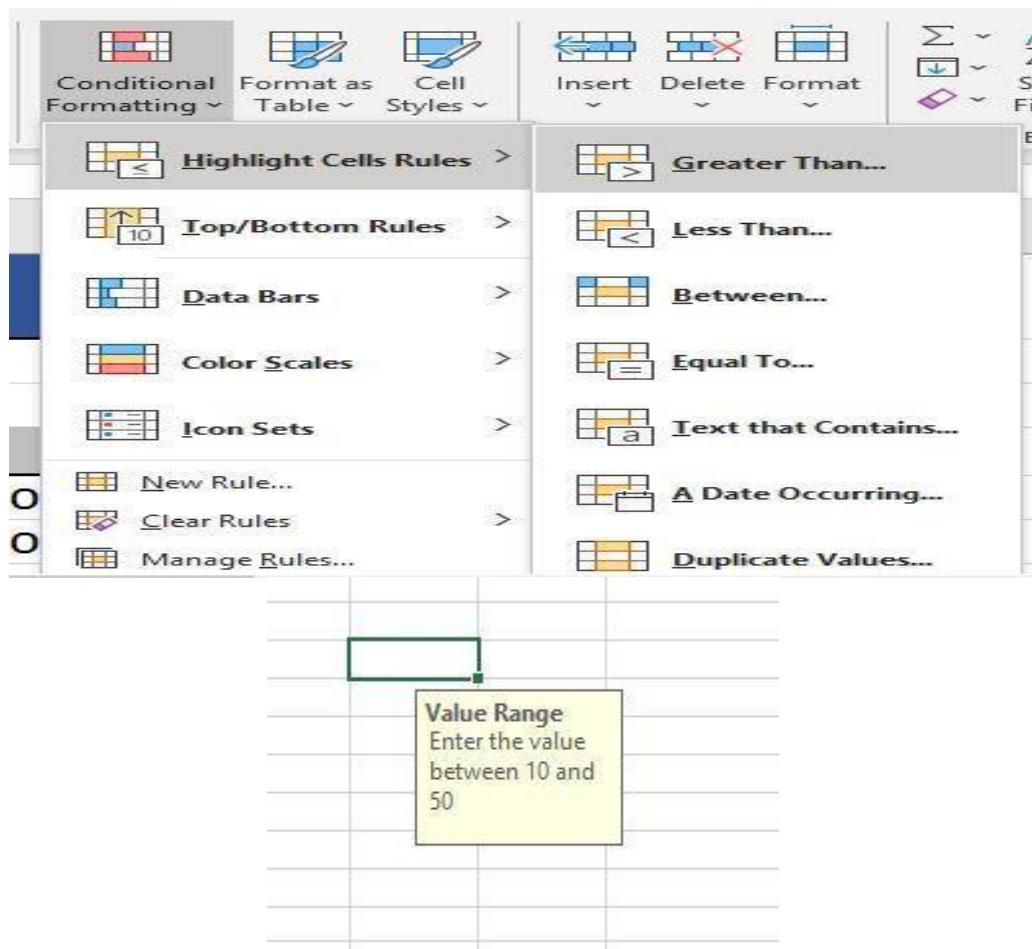
The settings tab is where you enter the validation criteria. There are eight options available to validate for user input:

- Any Value - It removes any existing data validation.
- Whole Number - It allows only whole numbers. For example, you can specify that the user must enter the number between 0 to 30.
- Decimal - The user must enter a number with decimal values.
- List - The user will have to create a drop-down list to choose from.
- Date - The user will have to enter the date format.
- Time - The user should enter a time.
- Text Length - It validates input based on the length of the data.
- Custom - It validates the user input using a custom formula.

Input Message Tab

You can set the input message to explain what data is allowed in a given cell. This tab is optional.

- Check the 'show input message when the cell is selected'.
- Enter a title.
- Enter an Input message.

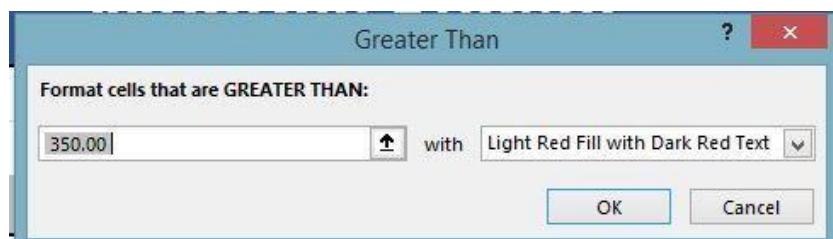


Error Alert Tab

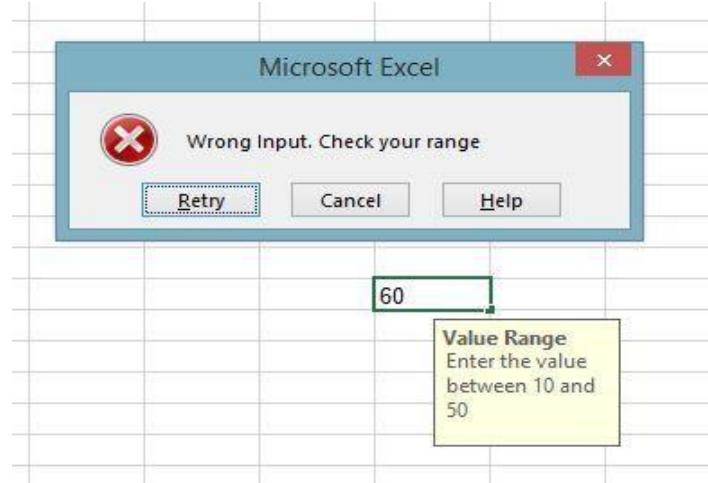
You can show the error message if the user tries to enter the invalid data.

On the error message tab:

- Check the 'Show error alert after invalid data is entered' box.
- Enter a title.
- Enter an error message.



Now, when you try to enter the value beyond the range, you will get an error message.



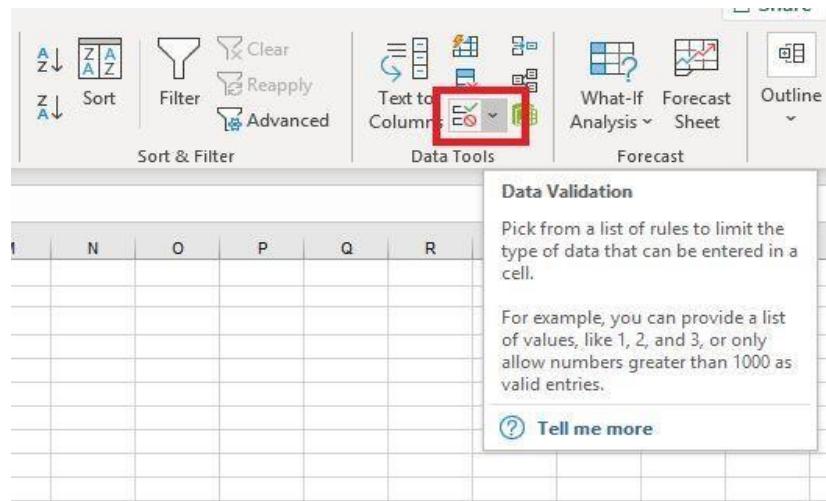
How to Validate Data in Excel?

Step 1 - Select The Cell For Validation

Select the cell you want to validate.

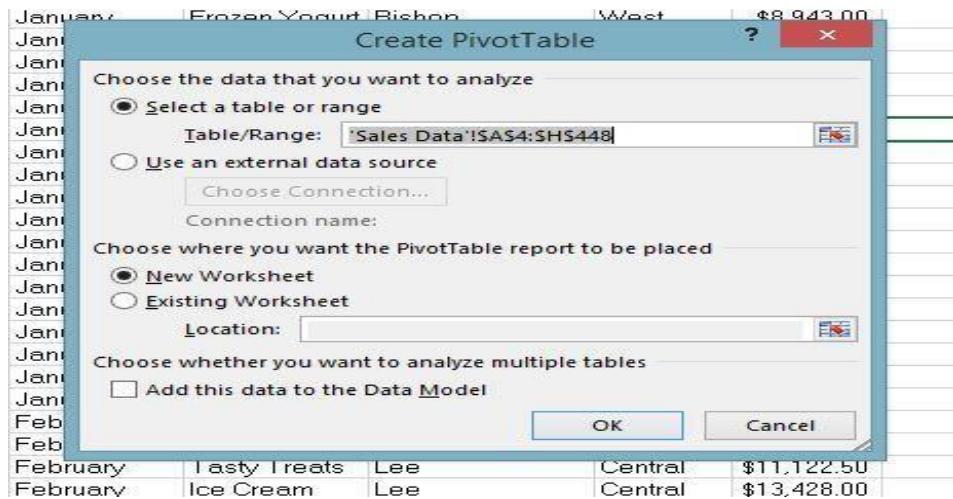
Go to the Data tab > Data tools, and click on the Data Validation button.

A data validation dialogue box will appear having 3 tabs - Settings, Input Message, and Error Alerts.



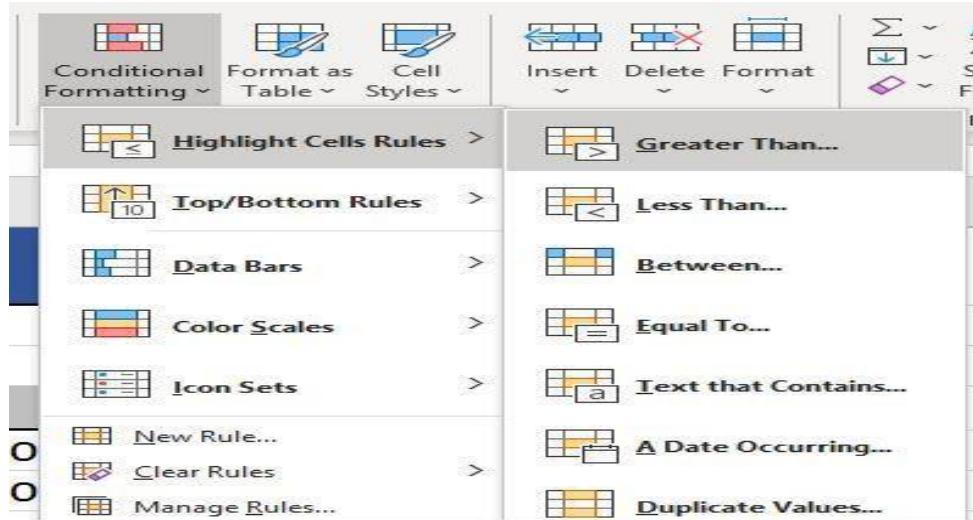
Step 2 - Specify Validation Criteria

On the settings tab, specify your validation criteria.



Step 3 - Under Allow, Select The Criteria

Under Allow, select an option from Whole Number, Decimal, List, Date, Time, Text Length, and Custom.



Step 4 - Select Condition

Under Data, select a condition and set required values based on what you choose for Allow and Data.



Step 5 - Input Message

Enter the input message if you want. This step is optional.

Step 6 - Custom Error Message

Set your custom error message. This step is optional.

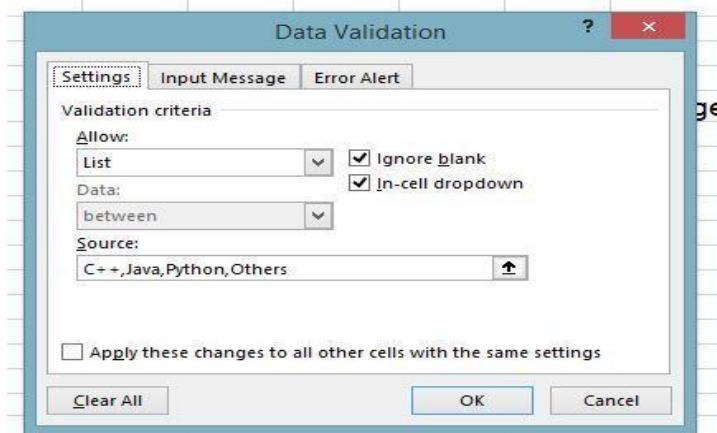
Step 7 - Click Ok

Click OK. Now, if you try entering a value outside the specified range (10, 50), it will result in an error

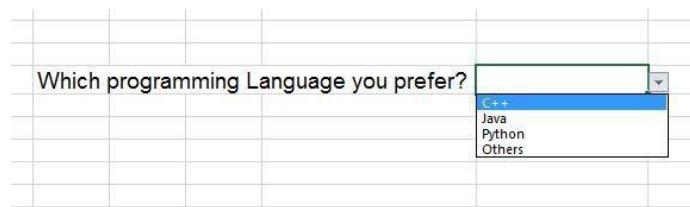
Excel Data Validation List (Drop-Down)

To add the drop-down list, follow the following steps:

1. Open the data validation dialog box.
2. On the Settings tab, select the list.
3. In the source box, enter the list of your validation, separated by commas.



Result is as follows:

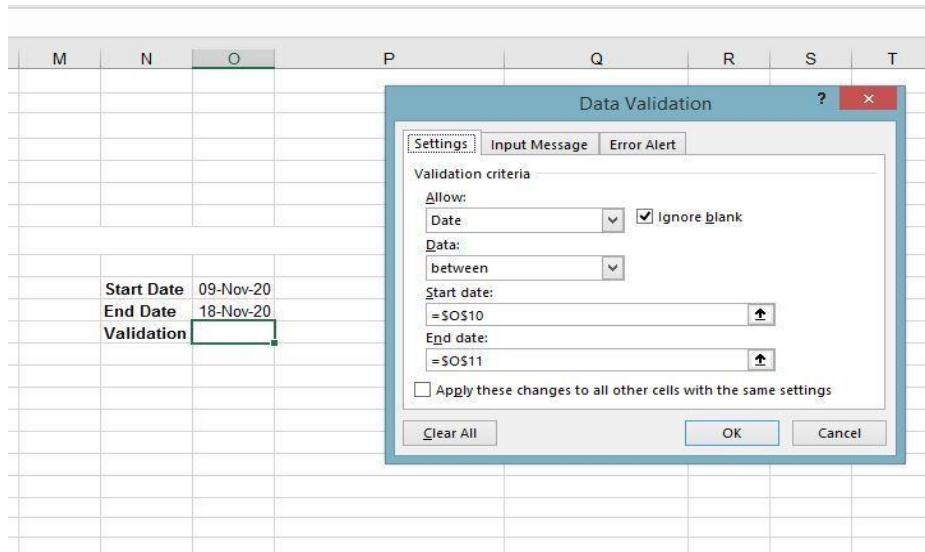


Date Validation

You can set-up the date validation in Excel. Select date in the allow box and pick up the appropriate criteria.

Follow these steps to set-up date validation:

1. Select the cells where you'd be applying the data validation.
2. From the allowed dropdown, select the date.
3. From the Data drop-down, select between.
4. Click in the Start Date box and select cell O10, where the Start Date is entered.
5. Press the F4 key to change the cell reference to an absolute reference -- \$O\$10.
6. Click in the End Date box and select cell O11, where the End Date is entered.
7. Press the F4 key to change the cell reference to an absolute reference -- \$O\$11.
8. Click OK to close the Data Validation window.



The above date validation will only accept date values between 9th Nov 2020 to 18th Nov 2020.

Conclusion

The data validation in Excel provides a way of limiting the mistakes from the user and collecting valid data from the user. It results in standard data entry and systematic reporting.

PIVOT TABLES

Pivot tables are among the most useful and powerful features in Excel. We use them in summarizing the data stored in a table. They organize and rearrange statistics (or "pivot") to draw attention to the valuable facts. You can take an extremely large data set and see the relevant information you need in a clean, concise, manageable way.

Sample Data

The sample data that we are going to use contains 448 records with 8 fields of information on the sale of products across different regions between 2013-2015. This data is perfect to understand the pivot table.

A	B	C	D	E	F	G	H
Sales Past Three Years							
<u>2013 - 2015</u>							
Year	Month	Type	Salesperson	Region	Sales	Units	Order #
2013	January	Ice Cream	Bishop	West	\$2,395.50	1597	001
2013	January	Ice Cream	Bishop	West	\$11,761.50	7841	002
2013	January	Frozen Yogurt	Bishop	West	\$8,943.00	5962	003
2013	January	Ice Cream	Bishop	West	\$2,395.50	1597	004
2013	January	Ice Cream	Bishop	West	\$11,761.50	7841	005
2013	January	Frozen Yogurt	Bishop	West	\$8,943.00	5962	006
2013	January	Frozen Yogurt	Lee	Central	\$14,596.50	9731	007
2013	January	Tasty Treats	Lee	Central	\$8,793.00	5862	008
2013	January	Frozen Yogurt	Lee	Central	\$14,596.50	9731	009
2013	January	Tasty Treats	Lee	Central	\$8,793.00	5862	010
2013	January	Ice Cream	Parker	North	\$4,666.00	5623	011
2013	January	Ice Cream	Parker	North	\$7,318.50	4879	012
2013	January	Ice Cream	Parker	North	\$4,666.00	5623	013
2013	January	Ice Cream	Parker	North	\$7,318.50	4879	014
2013	January	Popsicles	Pullen	South	\$3,553.50	2369	015
2013	January	Popsicles	Pullen	South	\$3,553.50	2369	016
2013	January	Frozen Yogurt	Watson	Central	\$14,596.50	9731	017
2013	January	Tasty Treats	Watson	Central	\$8,793.00	5862	018
2013	January	Frozen Yogurt	Watson	Central	\$14,596.50	9731	019
2013	January	Tasty Treats	Watson	Central	\$8,793.00	5862	020
2013	February	Ice Cream	Bishop	West	\$4,887.00	3258	021
2013	February	Ice Cream	Bishop	West	\$4,887.00	3258	022

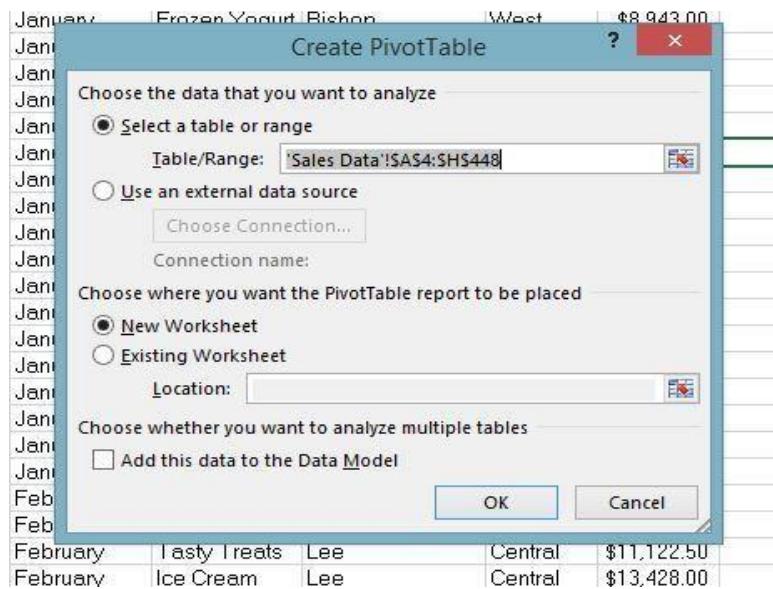
Insert Pivot Tables

To insert a pivot table in your sheet, follow these steps:

- Click on any cell in a data set.
- On the Insert tab, in the Tables group, click PivotTable.



A dialog box will appear. Excel will auto-select your dataset. It will also create a new worksheet for your pivot table.



- Click Ok. Then, it will create a pivot table worksheet.

The screenshot shows a blank PivotTable worksheet. On the right, the 'PivotTable Fields' pane is open, showing a list of fields to add to the report. The fields listed are: Year, Month, Type, Salesperson, Region, Sales, Units, and Order #. Below this list is a section for 'MORF TARI FS...'. At the bottom of the pane, there are four areas: FILTERS, COLUMNS, ROWS, and VALUES. On the left side of the worksheet, there is a placeholder for a PivotTable named 'PivotTable1'.

Drag Fields

To get the total sales of each salesperson, drag the following fields to the following areas.

- Salesperson field to Rows area.
- Sales field to Values area.

The screenshot shows the 'ROWS' section of the PivotTable Fields ribbon. Under 'ROWS', the field 'Salesperson' is selected. In the 'VALUES' section, the field 'Sum of Sales' is selected. At the bottom right of the ribbon, there is a 'Defer Layout Update' checkbox and a 'UPDATE' button.

A	B	C	D	E	F
1					
2					
3	Row Labels	Sum of Sales			
4	Bishop	616434			
5	Lee	758328			
6	Parker	809169			
7	Pullen	541107			
8	Watson	691020			
9	Grand Total	3416058			
10					
11					
12					
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24					
25					
26					
27					

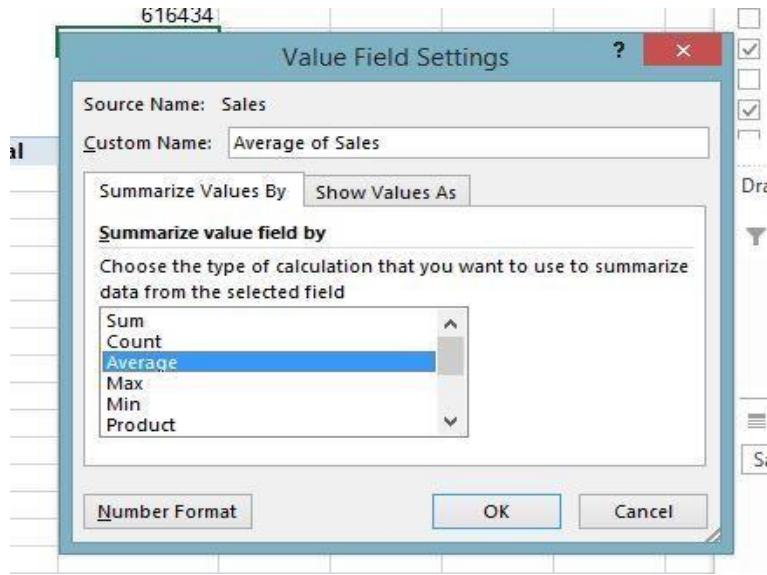
Value Field Settings

By default, Excel gives the summation of the values that are put into the Values section. You can change that from the Value Field Settings.

- Click on the Sum of Sales in the Values field.

The screenshot shows the context menu for the 'Sum of Sales' value field. The menu options include: Move Up, Move Down, Move to Beginning, Move to End, Move to Report Filter, Move to Row Labels, Move to Column Labels, Move to Values, Remove Field, and Value Field Settings... (which is highlighted).

- Choose the type of calculation you want to use.



- Click OK.

Row Labels	Average of Sales
Bishop	6849.266667
Lee	7899.25
Parker	7933.029412
Pullen	6441.75
Watson	9597.5
Grand Total	7693.824324

Sorting By Value

- Right-click any Sales value and choose Sort > Sort Largest to Smallest.

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

	Sum of Sales
Bishop	616434
Lee	758328
Parker	809169
Pullen	541107
Watson	691020
Grand Total	3416058

A context menu is open over the cell containing '758328'. The 'Sort' option is highlighted. Other visible options include 'Copy', 'Format Cells...', 'Number Format...', 'Refresh', 'Remove "Sum of Sales"', 'Summarize Values By', 'Show Values As', 'Show Details', 'Value Field Settings...', 'PivotTable Options...', and 'Hide Field List'.

Result:

Row Labels	Sum of Sales
Parker	809169
Lee	758328
Watson	691020
Bishop	616434
Pullen	541107
Grand Total	3416058

Two-Dimensional Pivot Table

We can create a pivot table in various two-dimensional arrangements. Drag the following fields to the different areas

- Salesperson to Rows area.
- Region to Columns area.
- Sales to Values area.

The screenshot shows a PivotTable in Excel with the following structure:

	Central	North	South	West	Grand Total
Bishop				616434	616434
Lee	758328				758328
Parker		809169			809169
Pullen			541107		541107
Watson	691020				691020
Grand Total	1449348	809169	541107	616434	3416058

The PivotTable Fields ribbon on the right side is open, showing the following settings:

- Choose fields to add to report:**
 - Search:
 - Type:
 - Salesperson:
 - Region:
 - Sales:
 - Units:
- Drag fields between areas below:**
 - Filters:** Year (All)
 - Columns:** Region
 - Rows:** Salesperson
 - Values:** Sum of Sales
- Defer Layout Update

Applying Filters to a Pivot table

Let's see how we can add a filter to our pivot table. We will continue with the previous example and add the Year field to the Filters area.

The screenshot shows the same PivotTable structure as before, but now with a filter applied:

	Central	North	South	West	Grand Total
Bishop				616434	616434
Lee	758328				758328
Parker		809169			809169
Pullen			541107		541107
Watson	691020				691020
Grand Total	1449348	809169	541107	616434	3416058

The PivotTable Fields ribbon now includes the Year filter in the Filters section:

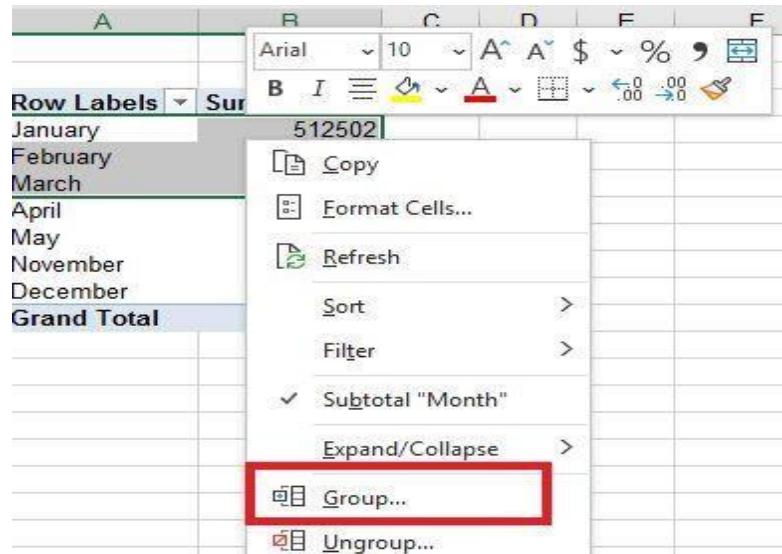
- Choose fields to add to report:**
 - Month:
 - Type:
 - Salesperson:
 - Region:
 - Sales:
- Drag fields between areas below:**
 - Filters:** Year
 - Columns:** Region
 - Rows:** Salesperson
 - Values:** Sum of Sales
- Defer Layout Update

You can see that it adds a filter on the top of the worksheet.

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.
- Right-click and click on Group.



Now, your data is grouped.

Percentage Contribution in a Pivot Table

There are various ways to display the values in a table. One way is to show the value as a percentage of the total.

- Add the sales field again to the values section.
- Right-click on the second instance and select % of Grand Total.

	Sum of Sales	Sum of Sales2
January	512502	512502
February	533070	533070
March	451143	451143
April	694512	694512
May	464652	464652
November	386589	386589
December	373590	373590
Grand Total	3416058	3416058

Conclusion

In this article, you've learned the basics of pivot table creation in Excel. You can see how simple it is to get started creating one and visualizing your data in many different ways.

PIVOT CHARTS

Charts and Graphs in Excel are proven to represent your data in the form of a visualization in the best way possible. But they always tend to lack the importance of bringing life to the visualization. Microsoft Excel came up with Pivot Charts in Excel to fix this that turn the whole data visualization platform into an interactive experience.

What Are Pivot Charts in Excel?

Pivot charts in excel are interactive data visualizations available in Excel by default. These Pivot charts in Excel help you summarise the data columns in the spreadsheet and help you present your data in a dynamically interactive manner in real-time.

Now that you have a brief overview of pivot charts in Excel, you will look at and understand how to work with them in real-time.

How to Implement Pivot Charts in Excel?

Consider the superstore dataset and create an interactive pivot chart using Excel.

Step 1

The following image is a glimpse of the original data.

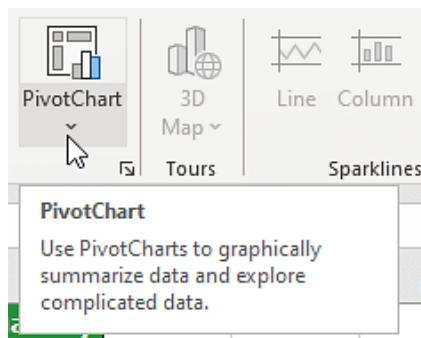
	A	B	C	D	E	F
1	Region	Category	State	Sub-Category	Sales	Quantity
2	West	Furniture	California	Furnishings	48.86	7
3	West	Office Supplies	California	Art	7.28	4
4	West	Technology	North Carolina	Phones	907.15	6
5	West	Office Supplies	Washington	Binders	18.504	3
6	West	Office Supplies	Texas	Appliances	114.9	5
7	West	Furniture	Texas	Tables	1706.2	9
8	West	Technology	Wisconsin	Phones	911.42	4
9	West	Office Supplies	Utah	Binders	407.98	3
10	West	Office Supplies	California	Storage	55.5	2
11	West	Office Supplies	California	Art	8.56	2
12	West	Technology	California	Phones	213.48	3
13	West	Office Supplies	Nebraska	Binders	22.72	4
14	West	Furniture	Nebraska	Tables	1044.6	3
15	South	Furniture	Pennsylvania	Bookcases	261.96	2
16	South	Furniture	Pennsylvania	Chairs	731.94	3
17	South	Furniture	Pennsylvania	Tables	957.58	5
18	South	Office Supplies	Pennsylvania	Storage	22.368	2
19	South	Office Supplies	Texas	Paper	15.552	3
20	South	Office Supplies	Texas	Storage	95.616	2
21	South	Office Supplies	Texas	Paper	75.88	2
22	South	Furniture	Indiana	Chairs	831.94	8
23	South	Furniture	Indiana	Furnishings	97.04	2

Step 2

Now, select any cell in the table and click on the "Insert" tab on the toolbar.

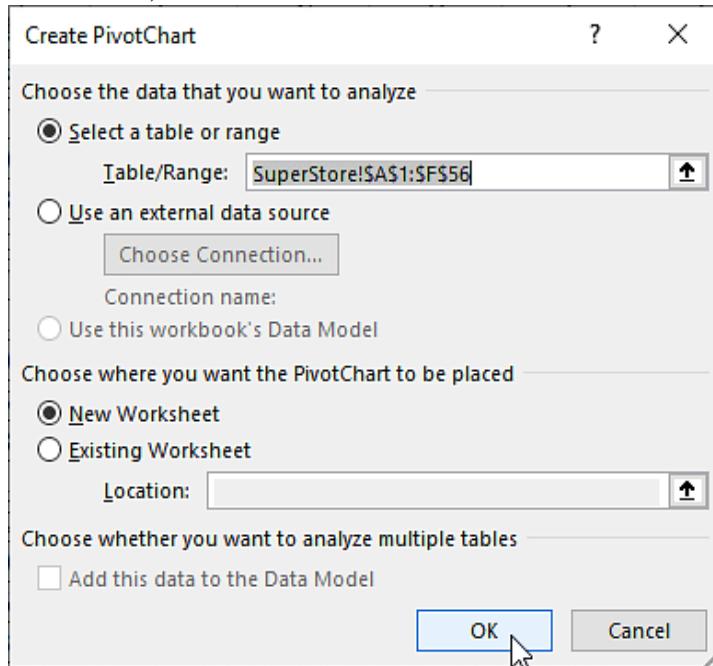


Select the pivot chart option in the "Charts" group. Select the "Pivot Chart" option as shown below.



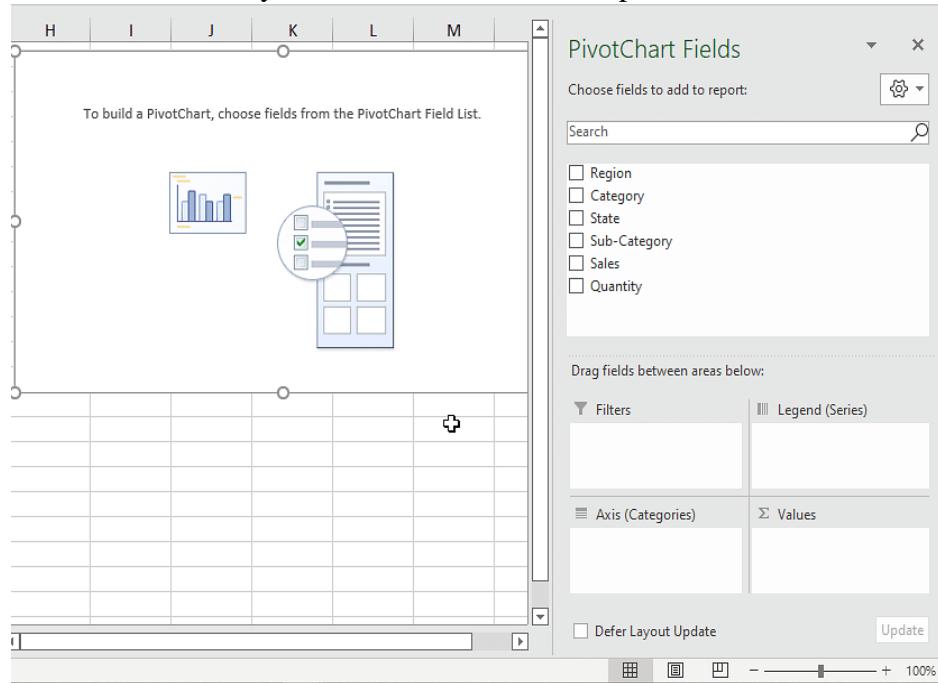
Step 3

You will now get a pop-up on the screen asking the position of the pivot chart. You must select the "New Worksheet" option for now, as shown below.



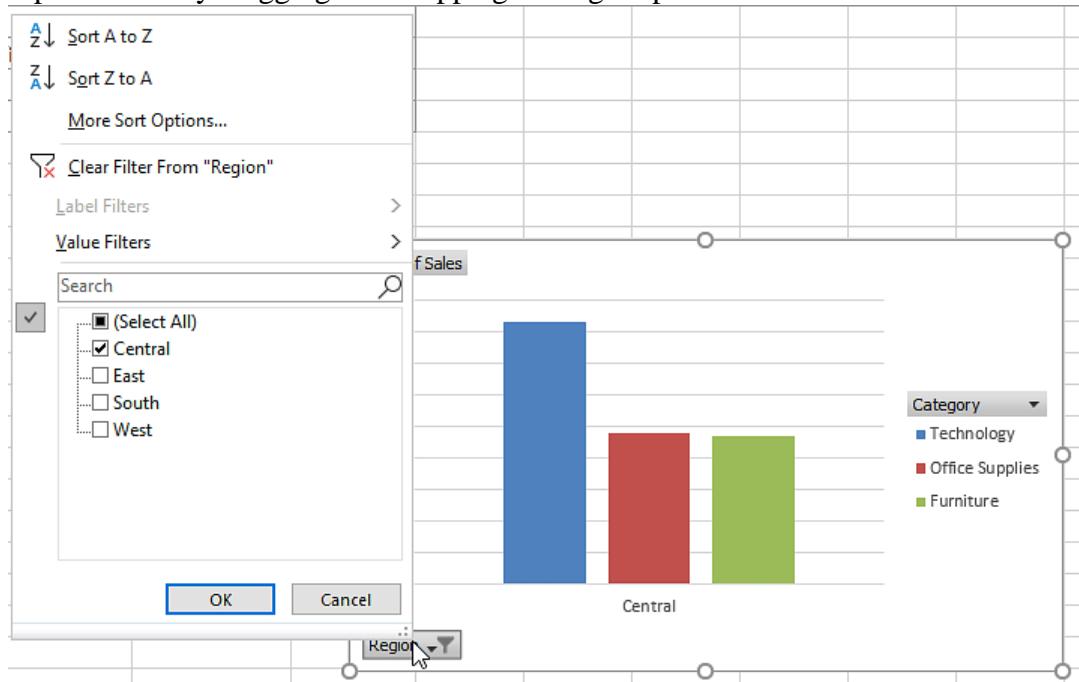
Step 4

Now, a new empty pivot chart will appear, as shown below. You can drag and drop the legends and parameters to obtain a fully functional and interactive pivot chart.



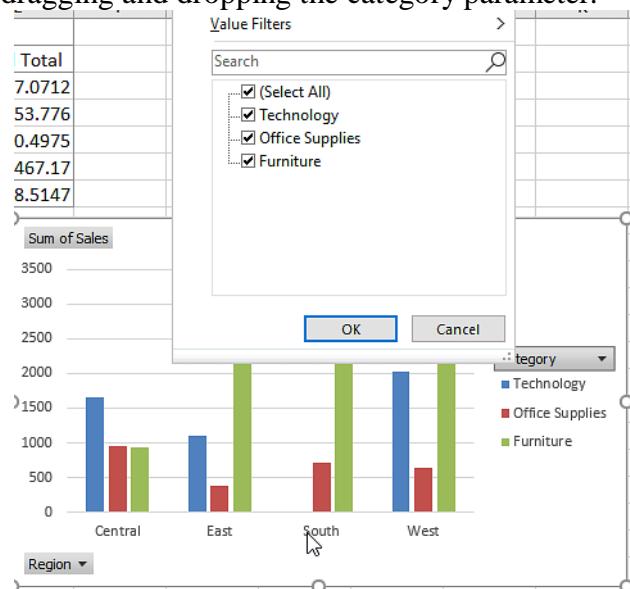
Step 5

Create a pivot chart by dragging and dropping the region parameter.



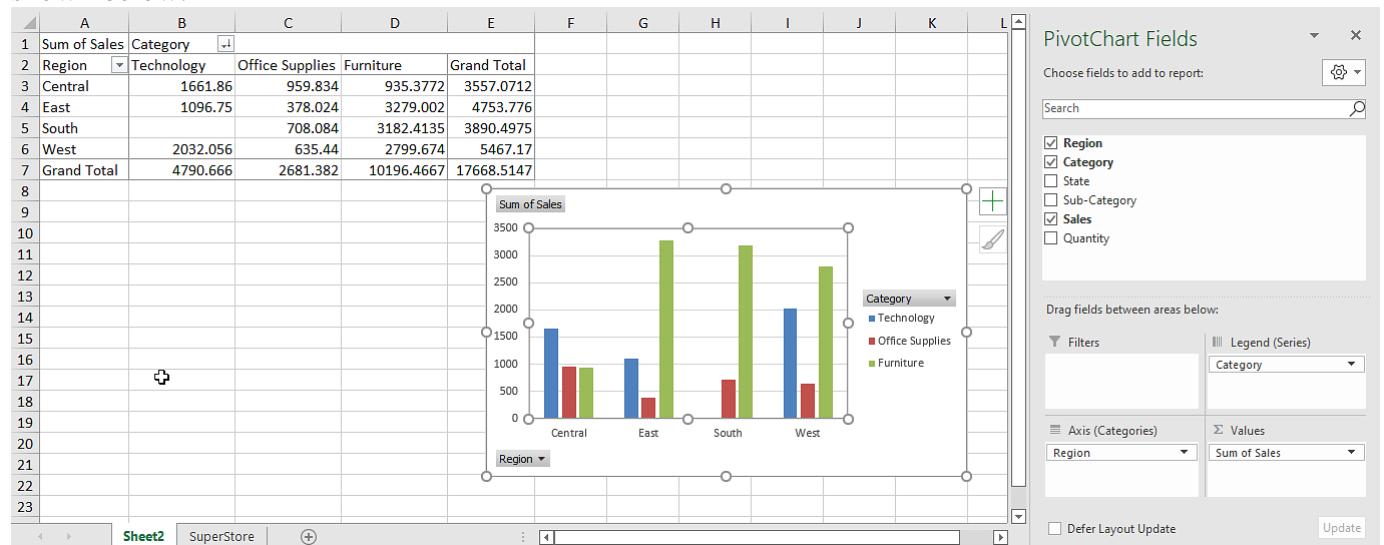
Step 6

Create a pivot chart by dragging and dropping the category parameter.



Similarly, you can create a variety of dynamically interactive pivot charts.

The overall sheet appears as follows. It has a dynamic pivot table and interactive pivot chart, as shown below.



Experiment No:4

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

Conditional Formatting

Conditional Formatting in Excel enables you to apply specific color to the cells with certain color depending on the condition. It is an excellent way to visualize data in a spreadsheet. You can also create rules with your own custom formulas.

What is Conditional Formatting?

Conditional formatting is a feature in Microsoft Excel that allows you to apply specific formatting to your cells according to certain criteria. It enables you to make sense of your data and spot significant trends.

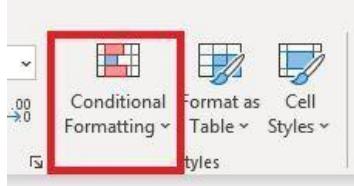
Highlight Cells Using Conditional Formatting

Let's start by highlighting the cells that have a value greater than 350. Execute the following steps:

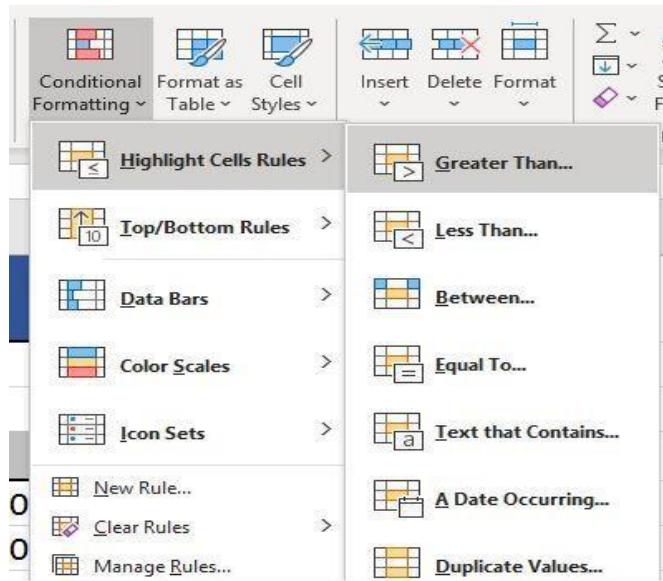
- Select the range of cells you want to apply the highlight.

Bills	Jan-16	Feb-16	Mar-16	Total	Percent
Rent	\$ 1,200.00	\$ 1,200.00	\$ 1,200.00	\$ 3,600.00	45.28%
Car	300.00	300.00	300.00	900.00	11.32%
Credit Cards	250.00	350.00	450.00	1,050.00	13.21%
Food	300.00	400.00	500.00	1,200.00	15.09%
Phone	400.00	400.00	400.00	1,200.00	15.09%
Total	\$ 2,450.00	\$ 2,650.00	\$ 2,850.00	\$ 7,950.00	100.00%

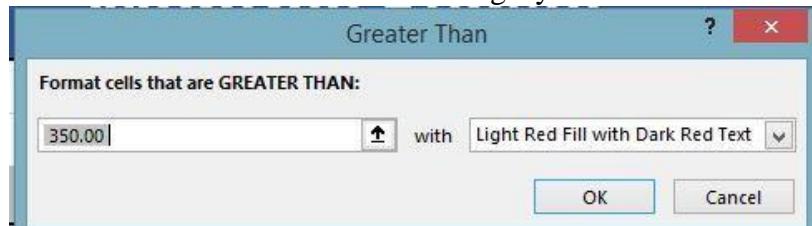
- On the Home tab, under Styles Group, click Conditional Formatting.



- Click Highlight Cells Rules > Greater Than



- Enter the desired value and select the formatting style.



- Click OK

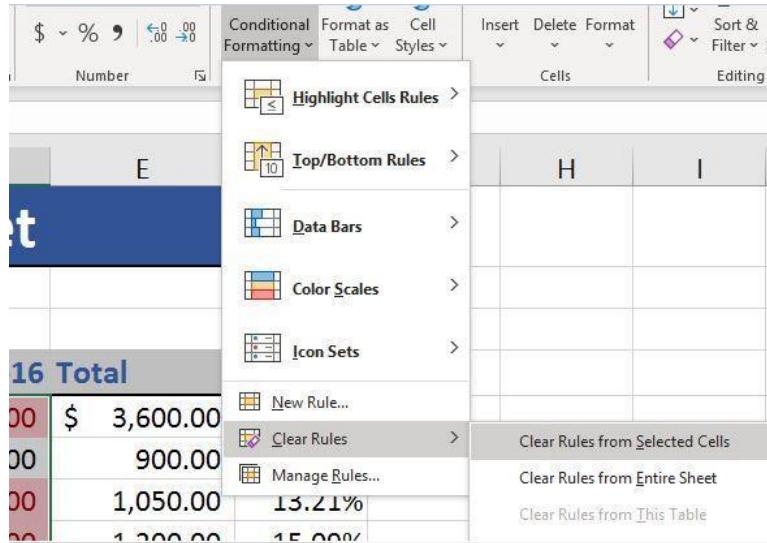
Result:

Bills	Jan-16	Feb-16	Mar-16	Total
Rent	\$ 1,200.00	\$ 1,200.00	\$ 1,200.00	\$ 3,600.00
Car	300.00	300.00	300.00	900.00
Credit Cards	250.00	350.00	450.00	1,050.00
Food	300.00	400.00	500.00	1,200.00
Phone	400.00	400.00	400.00	1,200.00

Clear Formatting

To clear the formatting rules, follow these steps:

- Select the range of cells where conditional formatting is applied.
- Go to Home tab > Styles Group > Conditional Formatting
- Click Clear Rules > Clear Rules from Selected Cells



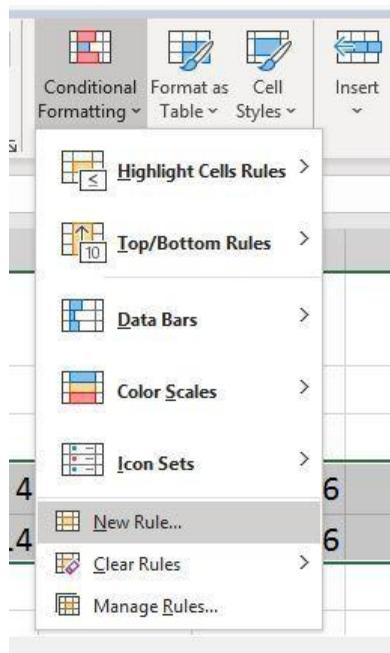
Conditional Formatting With Formulas

Formulas that apply conditional formatting must evaluate in true or false.

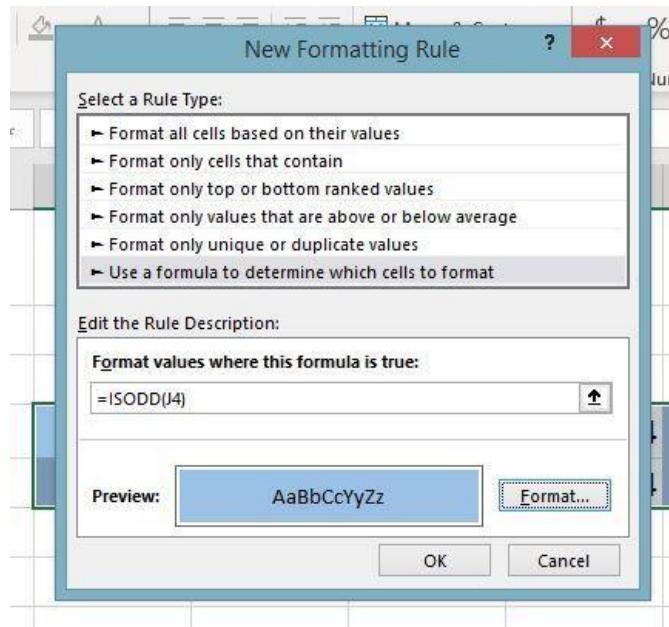
- Select the range of cells where you want to apply conditional formatting.

	A	B
1		
Inventory Status Check		
3	Enter Product Code Here:	AX25
5	Warehouse 1 Inventory:	95
6	Warehouse 2 Inventory:	
7	Warehouse 3 Inventory:	85

- On the Home tab, under Styles Group, click Conditional Formatting.
- Click New Rule.



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



- Select a formatting style and click OK.

Result:

1	2	3	4	5	6	7	8	9
11	12	13	14	15	16	17	18	19

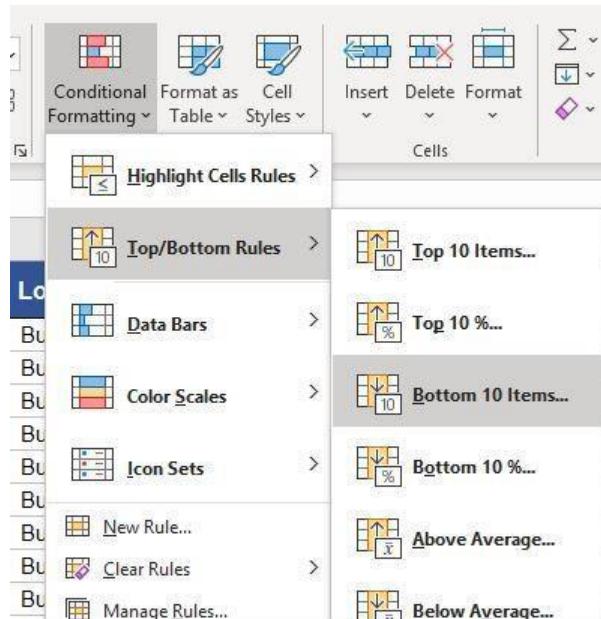
Highlight Bottom Items

Conditional Formatting can also be used to fetch the top and bottom items in your sheet. Suppose you want to get the five lowest pay rates among the given pay rates. Execute the following steps to do that:

- Select the range of cells where you want to apply conditional formatting.

Pay Rate	
\$	11.25
\$	12.25
\$	14.55
\$	11.25
\$	10.20
\$	12.25
\$	9.95
\$	12.30
\$	13.25
\$	10.20
\$	12.20
\$	14.25
\$	11.50
\$	10.35
\$	10.15
\$	12.25
\$	13.25
\$	9.50

- On the Home tab, under Styles Group, click Conditional Formatting.
- Click Top/Bottom rules > Bottom 10 Items



- Mention the number of lowest records you want to highlight.



- Click OK.

Pay Rate	
\$	11.25
\$	12.25
\$	14.55
\$	11.25
\$	10.20
\$	12.25
\$	9.95
\$	12.30
\$	13.25
\$	10.20
\$	12.20
\$	14.25
\$	11.50
\$	10.35
\$	10.15
\$	12.25
\$	13.25
\$	9.50

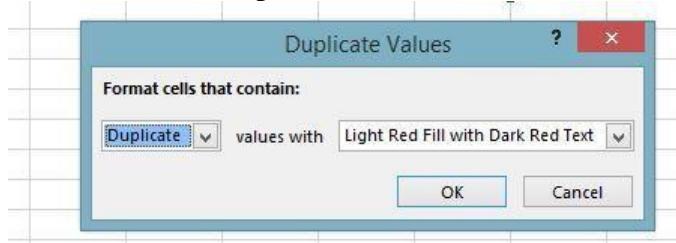
Find Duplicate Values in Range of Cells

You can highlight the duplicate values in a range of cells using conditional formatting. To implement that, follow these steps:

- Select the range of cells.

1	4	5	7	99	42	61
16	27	91	87	23	45	87
5	74	2	5	9	10	75
11	62	55	99	23	45	80

- On the Home tab, go to Styles Group > Conditional Formatting.
- Select Highlight Cells Rules > Duplicate values.



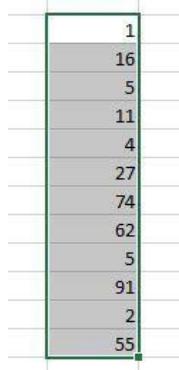
Result:

1	4	5	7	99	42	61
16	27	91	87	23	45	87
5	74	2	5	9	10	75
11	62	55	99	23	45	80

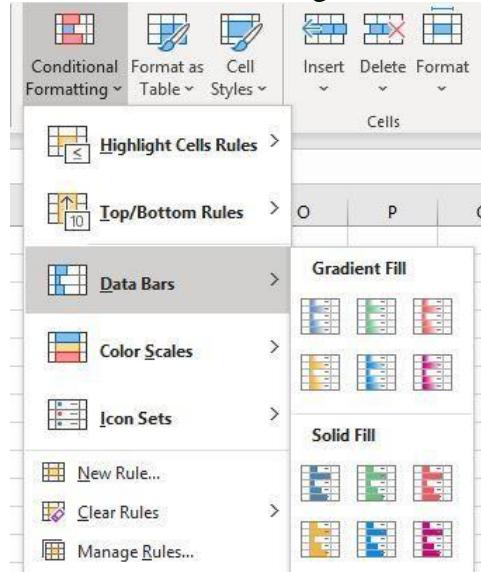
Data Bars in Conditional Formatting

Data bars in Excel are used to visualize the range of cells. The longer bar represents a higher value. To add the data bars, follow these steps:

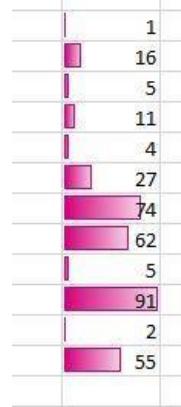
- Select the range of cells.



- On the Home tab, go to Conditional Formatting > Data Bars and select a subtype.



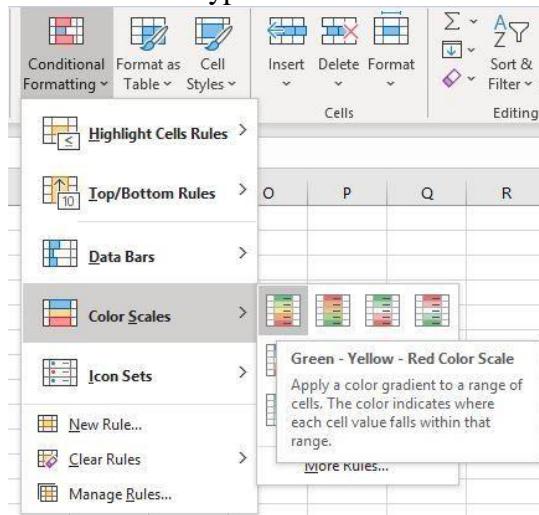
Result:



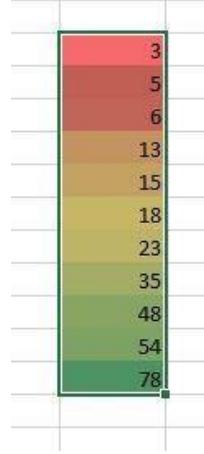
Color Scales in Conditional Formatting

Color Scales in Excel make the visualization of values in a range of cells very easy. To add a color scale, follow these steps:

- Select the range of cells.
- On the Home tab, go to Styles Group > Conditional Formatting.
- Click Color Scales and select a subtype.



Result:

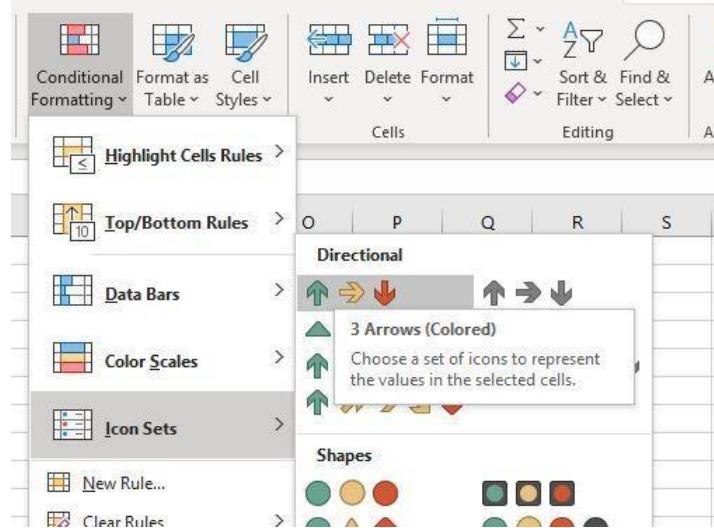


- The red color represents the minimum value in the range.
- The yellow color represents the median value.
- The green color represents the maximum value.
- All the other values are colored proportionally.

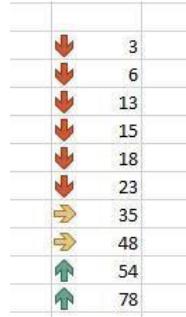
Icon Sets in Conditional Formatting

Excel Conditional Formatting icon sets are used to visualize the data with the help of shapes, arrows, check marks, and other objects. To add an icon sets, follow these steps:

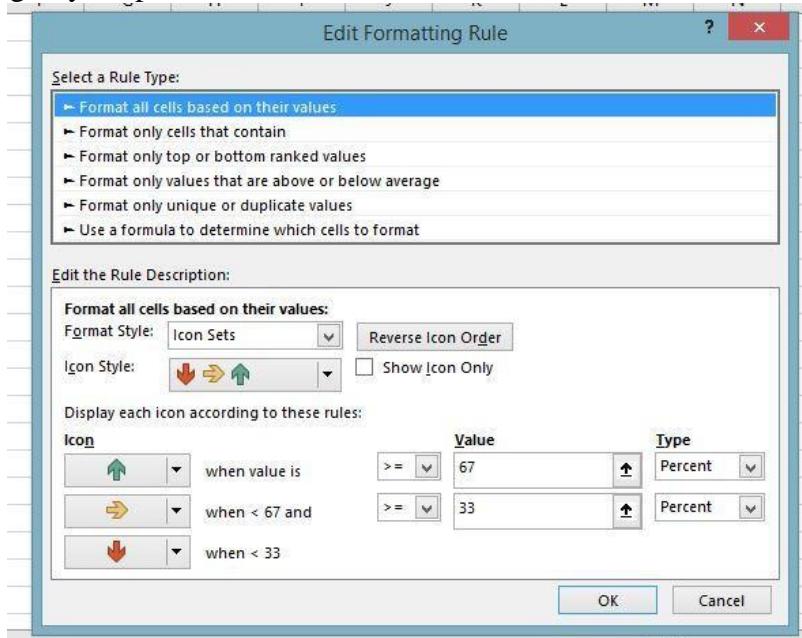
- Select the range of cells.
- On the Home tab, go to Styles Group > Conditional Formatting.
- Click Icon Sets and select a subtype.



Result:



To update the rules, go to Conditional Formatting > Manage Rules > Edit rules. You can change the rules according to your preferences.



Conclusion

Here, it discusses several examples and scenarios where conditional formatting can be used. It saves you a lot of time and makes your data visualization easier.

What-If Analysis

Excel What-if Analysis is a procedure employed to the Excel sheets with formulas to see the tabular data results when any variations are applied to the original values without having to recreate a new sheet.

Excel What-if Analysis Scenario Manager

The Scenario Manager in What-if Analysis Excel is used to consume the original data and the mathematical formulas implemented on the data to recreate another scenario that inherits similarities from the previous table and generates a new table.

For better learning, let us consider that you are running an IT company and you have employees from three different bands, namely:

- Band A

- Band B
- Band C

Employees of different bands have different compensations, Basic Pay, and HRAs. The brute force method of excel would recommend creating three different tables with similar data and input the values. This time-consuming process can be eliminated by using Scenario manager. The whole idea of using Scenario manager is to avoid duplication of similar data. You can also generate the summary of all the three tables in one sheet in the form of a detailed visualization.

Let us execute an example. The following image depicts the details of Band C Employees. Cells B8, B16, and B18 include a mathematical formula that calculates the summation of the other cells above them and states them as "Compensation from Company", "Maintenance Bill Per Employee", and "Total Expense to Company", respectively.

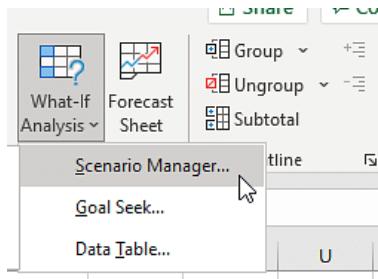
	A	B
1	Band C	Cost
2		
3	Employee Basic	4000
4	Employee HRA	2500
5	Employee PF	500
6	Employee Allowance	500
7		
8	Compensation from Company	7500
9		
10	Total Employees	50
11		
12	Employee IT and Admin needs	100
13	Employee stationery	150
14	Employee Internet	75
15		
16	Maintainence Bill Per Employee	325
17		
18	Total Expense to Company	7825

Now, let us use this table and the Scenario manager from Excel What-if Analysis to recreate the same table for Band B and Band A employees.

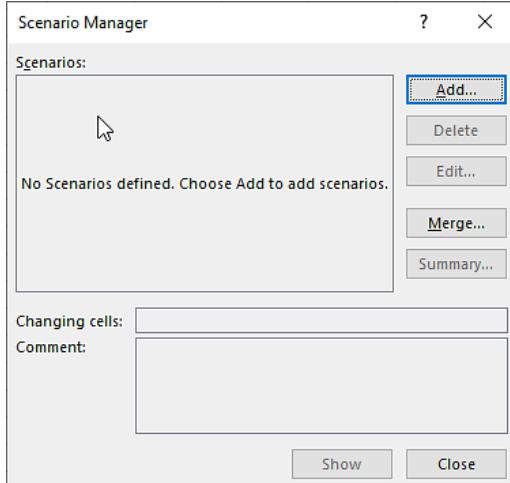
Select the cells consisting of numerical data and ignore the cells with mathematical formulas as shown below.

	A	B
1	Band C	Cost
2		
3	Employee Basic	4000
4	Employee HRA	2000
5	Employee PF	500
6	Employee Allowance	500
7		
8	Compensation from Company	7000
9		
10	Total Employees	50
11		
12	Employee IT and Admin needs	100
13	Employee stationery	150
14	Employee Internet	75
15		
16	Maintainence Bill Per Employee	325
17		
18	Total Expense to Company	7325

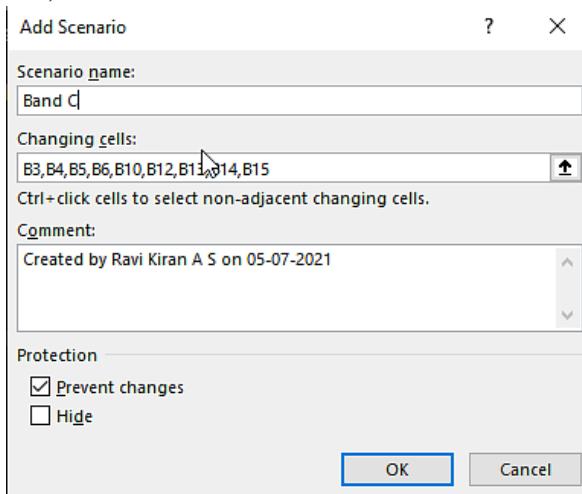
Go to the Data option from the toolbar and select the Excel What-if Analysis option from the Forecast Ribbon, as shown below.



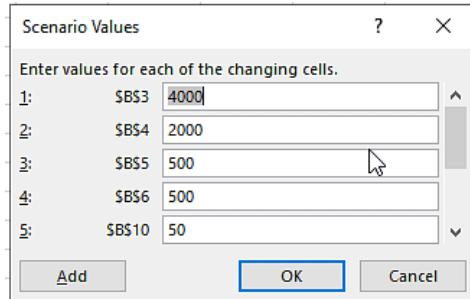
A dialog box will appear on the screen with empty scenarios. To add a scenario, select add option as shown below.



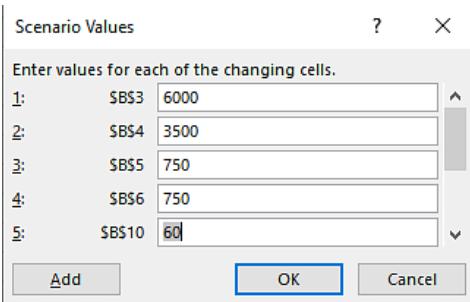
Then, a new dialog box will appear on the screen with cell addresses. Type a name for the Scenario and press OK. Here, we have chosen Band C as the name for this Scenario.



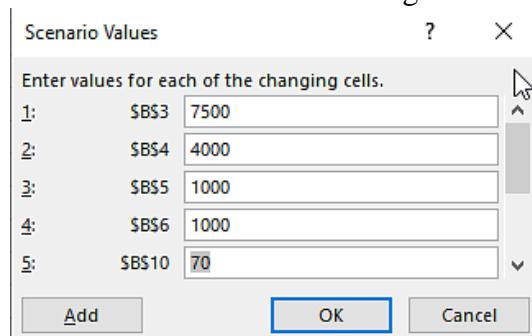
The next screen will show a small dialog box with all the values ready for Band C, as shown below.



Similarly, you can add two more scenarios: Band B and Band A in this example. You can select the add option, and you will have a new dialog box with editable data options. Now, update the values for Band B and select OK as shown below.



And the last step is to create a scenario for Band A. To update values, follow the same procedure as before; click on add and edit the values in the new dialog box and press OK as shown below.



Now that you have added all the values, you have three different scenarios, namely Band A

	A	B
1	Band C	Cost
2		
3	Employee Basic	7500
4	Employee HRA	4000
5	Employee PF	1000
6	Employee Allowance	1000
7		
8	Compensation from Company	13500
9		
10	Total Employees	70
11		
12	Employee IT and Admin needs	100
13	Employee stationery	150
14	Employee Internet	75
15		
16	Maintainence Bill Per Employee	325
17		
18	Total Expense to Company	13825

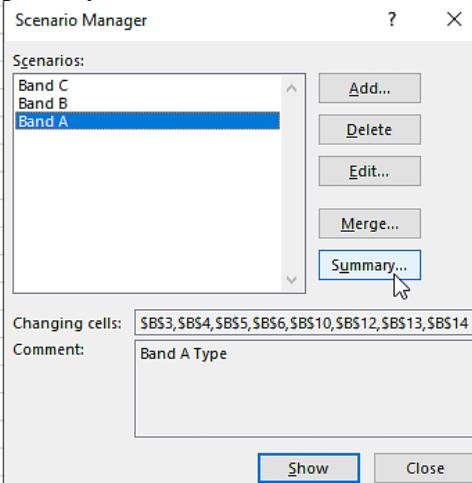
Band B

	A	B
1	Band C	Cost
2		
3	Employee Basic	6000
4	Employee HRA	3500
5	Employee PF	750
6	Employee Allowance	750
7		
8	Compensation from Company	11000
9		
10	Total Employees	60
11		
12	Employee IT and Admin needs	100
13	Employee stationery	150
14	Employee Internet	75
15		
16	Maintainence Bill Per Employee	325
17		
18	Total Expense to Company	11325

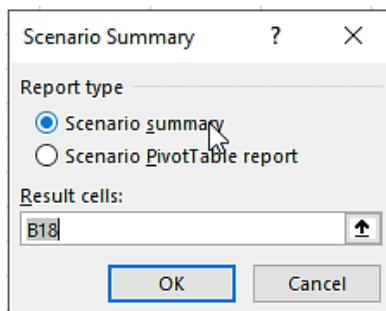
Band C

	A	B
1	Band C	Cost
2		
3	Employee Basic	4000
4	Employee HRA	2500
5	Employee PF	500
6	Employee Allowance	500
7		
8	Compensation from Company	7500
9		
10	Total Employees	50
11		
12	Employee IT and Admin needs	100
13	Employee stationery	150
14	Employee Internet	75
15		
16	Maintainence Bill Per Employee	325
17		
18	Total Expense to Company	7825

If you click on the summary option, you can create a whole summary as well.



After clicking on the summary, you will find a new dialog box. Select Scenario Summary and press OK.



Then, in a new sheet, you will have the complete detailed summary of all three tables. The first column is entirely editable, and the cell addresses can be named with row names in the original data.

1	A	B	C	D	E	F	G	I
2								
3								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								

Scenario Summary

Current Values:	Band C	Band B	Band A
Changing Cells:			
\$B\$3	7500	4000	6000
\$B\$4	4000	2500	3500
\$B\$5	1000	500	750
\$B\$6	1000	500	750
\$B\$10	70	50	60
\$B\$12	100	100	100
\$B\$13	150	150	150
\$B\$14	75	75	75
Result Cells:			
\$B\$18	13825	7825	11325

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.

Excel What-if Analysis Goal Seek in Excel

In the Excel What-if Analysis tab, we have an option named Goal Seek in Excel. This option helps the user run all possible permutations and combinations to generate or achieve a target in the resultant cell.

To understand it elaborately, let us consider an example as follows. Here we have a set of students, their marks list, and their final aggregate.

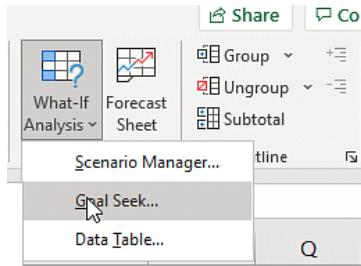
As you can see, a few students do not have the aggregate as 60% or above. To score 60% or above, the candidates need to write an improvement exam and score certain marks to achieve the 60% or above target.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	S no	Name	Roll No	Year	Blood Group	Engg 1	Engg 2	Engg 3	Engg 4	Engg 5	Engg 6	Marks Obtained	Percentage	Round-off Percentage	Total Marks
2	1	Stacy	3011	IV	O-ve	32	65	86	88	79	79	429	71.5	71.5	600
3	2	Martha	4011	IV	B+ve	56	45	92	65	65	85	408	68	68	600
4	3	Nick	2028	IV	A-ve	76	44	85	32	52	65	354	59	59	600
5	4	Tony	5072	IV	AB+ve	43	87	82	34	78	85	409	68.16666667	68.2	600
6	5	Steve	8874	IV	A-ve	56	24	88	90	65	54	377	62.83333333	62.9	600
7	6	James	9675	IV	B+ve	33	23	75	55	62	64	312	52	52	600
8	7	Sarah	5325	IV	AB+ve	34	33	56	64	94	62	343	57.16666667	57.2	600
9	8	Williams	4824	IV	AB-ve	65	95	78	63	89	86	476	79.33333333	79.4	600
10	9	Iordan	6435	IV	O-ve	44	33	98	60	82	89	406	67.66666667	67.7	600
11	10	Jack	7424	IV	O+ve	64	35	55	62	72	91	379	63.16666667	63.2	600

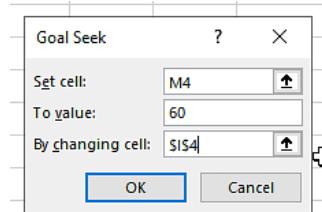
We can use Excel What-if Analysis and employ Goal Seek in the excel method to predict the required marks to achieve 60% or above as the target aggregate. To implement goal seek in excel, you need to select the cell from the aggregate column as shown below.

L	M	N
Marks Obtained	Percentage	Round-off Percentage
429	71.5	71.5
408	68	68
354	59	59
409	68.16666667	68.2
377	62.83333333	62.9
312	52	52
343	57.16666667	57.2
476	79.33333333	79.4
406	67.66666667	67.7
379	63.16666667	63.2

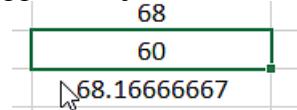
Now, click on the data option from the toolbar and go to the forecast ribbon and click on the Excel what-if analysis button. A small window will appear, and you must choose the second option that reads Goal Seek, as shown below.



A small window will appear on the screen, and here, you need to specify the location of the target cell, the target value, and the cell you wish to change. Here, your target cell is M4, the target value is 60, and since you would like to write an improvement exam for subject Engg 4, the cell address will be I4.



After entering the values, select OK, and Excel will automatically run all permutations and combinations and provide the result. In this case, the outcome or the result provided is the target score you need to achieve in the "Engg 4" subject to score 60% aggregate.



In the next stage of Excel What-if Analysis, we will learn about Data Table.

Excel What-if Analysis Data Table

Data Table in Excel What-if Analysis eases the challenging task of calculating fields and storing results in cells with just a simple drag and drop operation. A simple sentence can be complicated to understand, so let us go through an example.

Let us consider that you are borrowing a car loan from a bank. Your loan amount is two lakh rupees, and the Rate of Interest is 10% with 25 months of tenure.

Now, you wish to calculate and see the different EMI rates for different rates of interest.

So, let us calculate the following.

- EMI
- Total Amount
- Interest Amount

To calculate the above-mentioned fields, we require the following respective formulas as shown below.

EMI

X	✓	f _x	=PMT(B3 /12, B4, -B5)
B	C	D	

Total Amount

X	✓	f _x	=B4*B7)
B	C	D	

Interest Amount

X	✓	f _x	=B8-B5)
B	C	D	

The final table will appear as follows.

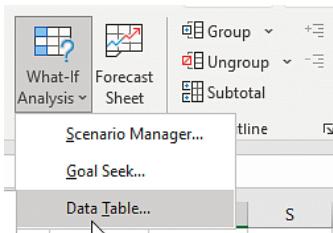
A	B
1 Car Loan	Amount
2	
3 Rate of Interest	10%
4 Tenure	25
5 Loan Amount	₹ 2,00,000.00
6	
7 Monthly Installment	₹ 8,895.42
8 Total Amount	₹ 2,22,385.38
9 Interest Amount	₹ 22,385.38

The main problem statement is to find out the EMI for different rates of interest.

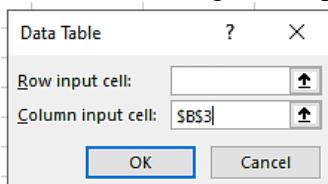
Now, create a new column with all the rates of interest you wish to look for. Followed by that, write the cell address of the EMI in your table in the next column. In this case, it is B7. The table should appear something like below.

Interest Rates	₹ 8,895.42
2%	
3%	
4%	
5%	
6%	
7%	
8%	
9%	
10%	
11%	
12%	

Now, select the entire table, click on the Excel What-if Analysis, and select the data table option.



A new window will pop up on the screen. In the dialog box, provide the rate of the interest cell address. In this case, the cell address is B3. The image will appear as follows.



Now, select OK, and the final data will appear as shown below.

Interest Rates	₹ 8,895.42
2%	₹ 8,174.49
3%	₹ 8,262.60
4%	₹ 8,351.28
5%	₹ 8,440.54
6%	₹ 8,530.37
7%	₹ 8,620.78
8%	₹ 8,711.75
9%	₹ 8,803.30
10%	₹ 8,895.42
11%	₹ 8,988.10
12%	₹ 9,081.35

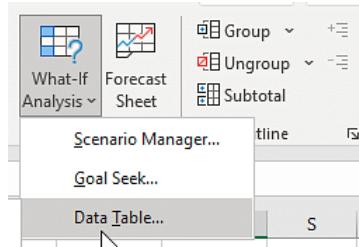
This procedure of Excel What-if Analysis is called a single input data table procedure. There is another procedure in Excel What-if Analysis, which is the double input data table.

Let us imagine that you are interested in learning EMI values for different Loan Amounts and different Rates of interest. You can do that by filling the different interest rates as the row data and the various loan amounts as the column data, as shown below.

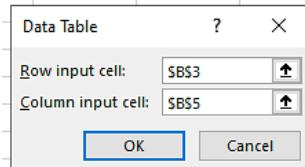
₹ 8,895.42	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
₹ 1,50,000.00											
₹ 1,60,000.00											
₹ 1,70,000.00											
₹ 1,80,000.00											
₹ 1,90,000.00											
₹ 2,00,000.00											
₹ 2,10,000.00											
₹ 2,20,000.00											
₹ 2,30,000.00											
₹ 2,40,000.00											
₹ 2,50,000.00											

Look at the first cell. The G11, in this case, stores the data rupees 8895.42; this value is borrowed from the cell location B7 just like the previous example.

Now, select the entire set of rows and columns, as shown above, then select the excel what-if analysis, and click on the data table.



The following dialog box will appear. Provide the inputs. You need to give the cell address of the Rate of interest and Loan Amount in this case. So, your cell addresses are B3 and B7.



Select OK, and the final data table with auto-filled data will appear as follows.

	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
₹ 1,50,000.00	₹ 6,130.87	₹ 6,196.95	₹ 6,263.46	₹ 6,330.40	₹ 6,397.78	₹ 6,465.58	₹ 6,533.81	₹ 6,602.47	₹ 6,671.56	₹ 6,741.07	₹ 6,811.01
₹ 1,60,000.00	₹ 6,539.59	₹ 6,610.08	₹ 6,681.02	₹ 6,752.43	₹ 6,824.30	₹ 6,896.62	₹ 6,969.40	₹ 7,042.64	₹ 7,116.33	₹ 7,190.48	₹ 7,265.08
₹ 1,70,000.00	₹ 6,948.31	₹ 7,023.21	₹ 7,098.59	₹ 7,174.46	₹ 7,250.82	₹ 7,327.66	₹ 7,404.99	₹ 7,482.80	₹ 7,561.10	₹ 7,639.88	₹ 7,719.15
₹ 1,80,000.00	₹ 7,357.04	₹ 7,436.34	₹ 7,516.15	₹ 7,596.49	₹ 7,677.33	₹ 7,758.70	₹ 7,840.58	₹ 7,922.97	₹ 8,005.87	₹ 8,089.29	₹ 8,173.22
₹ 1,90,000.00	₹ 7,765.76	₹ 7,849.47	₹ 7,933.72	₹ 8,018.51	₹ 8,103.85	₹ 8,189.74	₹ 8,276.16	₹ 8,363.13	₹ 8,450.64	₹ 8,538.69	₹ 8,627.28
₹ 2,00,000.00	₹ 8,174.49	₹ 8,262.60	₹ 8,351.28	₹ 8,440.54	₹ 8,530.37	₹ 8,620.78	₹ 8,711.75	₹ 8,803.30	₹ 8,895.42	₹ 8,988.10	₹ 9,081.35
₹ 2,10,000.00	₹ 8,583.21	₹ 8,675.73	₹ 8,768.84	₹ 8,862.57	₹ 8,956.89	₹ 9,051.81	₹ 9,147.34	₹ 9,243.46	₹ 9,340.19	₹ 9,437.50	₹ 9,535.42
₹ 2,20,000.00	₹ 8,991.94	₹ 9,088.86	₹ 9,186.41	₹ 9,284.59	₹ 9,383.41	₹ 9,482.85	₹ 9,582.93	₹ 9,683.63	₹ 9,784.96	₹ 9,886.91	₹ 9,989.49
₹ 2,30,000.00	₹ 9,400.66	₹ 9,501.99	₹ 9,603.97	₹ 9,706.62	₹ 9,809.93	₹ 9,913.89	₹ 10,018.52	₹ 10,123.79	₹ 10,229.73	₹ 10,336.31	₹ 10,443.55
₹ 2,40,000.00	₹ 9,809.39	₹ 9,915.12	₹ 10,021.54	₹ 10,128.65	₹ 10,236.45	₹ 10,344.93	₹ 10,454.10	₹ 10,563.96	₹ 10,674.50	₹ 10,785.72	₹ 10,897.62
₹ 2,50,000.00	₹ 10,218.11	₹ 10,328.25	₹ 10,439.10	₹ 10,550.67	₹ 10,662.96	₹ 10,775.97	₹ 10,889.69	₹ 11,004.12	₹ 11,119.27	₹ 11,235.12	₹ 11,351.69

DATA TABLES

A data table is a document comprising columns, rows and cells that contain specific values. They store information that people can retrieve later and update as needed. The data table title, column headers and row headers can help a user understand the information in the table more clearly. The document also processes the data through various operations, such as ordering, arranging, filtering and searching. Most data tables provide insight into sets of information. For example, someone running a children's summer camp might use a data table to track the names, arrival times, registration status, and contact info of the attending families. This allows them to sort the most important data from their records and keep it separate from irrelevant details. Storing all this information in one place can make it easier to access and can also help those analyzing the data develop meaningful conclusions about a table's contents.

DATA TABLE EXAMPLE

Data tables can look different depending on an individual's or organization's needs. Most data tables have columns and rows to help organize and easily access information. Here's a simplified

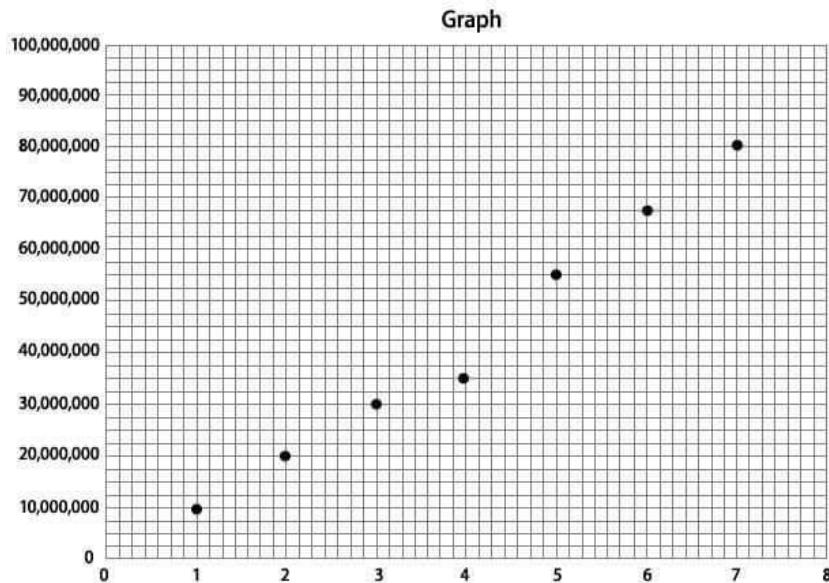
example: Outdoor Adventures for Kids, a summer camp program, wants to see how enrollment for various age groups has changed over the years. The management team creates a data table to show the numbers.

Age group	2020 Enrollment	2021 Enrollment	2022 Enrollment
8-10	25	32	34
11-13	21	27	24
14-16	22	24	25

What Is A Graph?

Graphs mainly focus on raw data and depict the trend overtime-related to such data. A two-dimensional graph shows the relationship between the data through a line, curve, etc., using the horizontal line along the bottom (called X-axis) and the vertical line up the side (called Y-axis). One dictionary defines a Graph as, “**A Graph is a mathematical diagram that shows the relationship between two or more sets of numbers or measurements**”. A graph allows the user to easily represent the values in the data through a visual representation.

Graph Example An example of a basic graph is shown below:



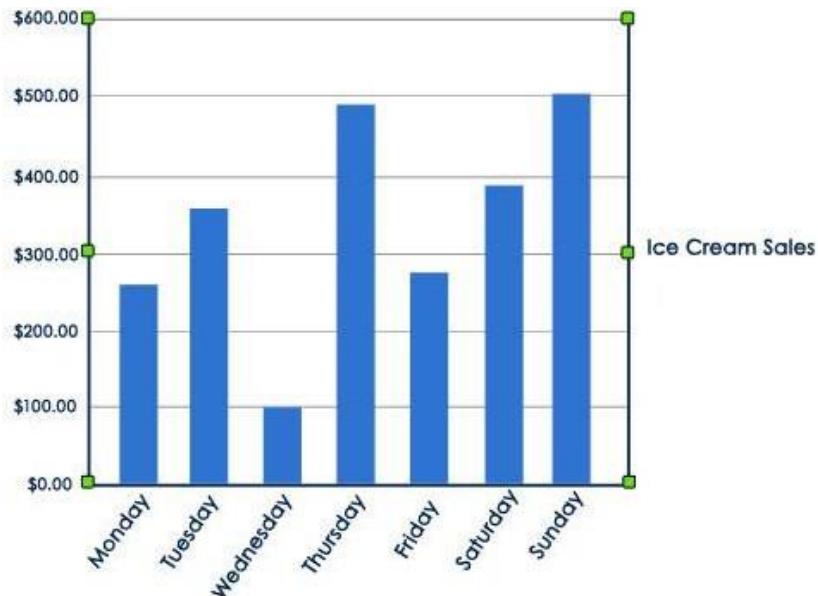
The above graph is a basic graph that allows the user to visualize that the data plotted on its Y-axis are on an increasing trend, shown in years on the X-axis. There are two types of graphs: bar graphs and line graphs.

What Is A Chart?

A chart is a type of representation of large sets of data, which makes the user understand the same better. Using the same helps predict existing data and forecast future data based on the

present data pattern. A chart can be a diagram, a picture, or a graph. We can transform data variables into a visual, graphical, or pictorial, representation using charts.

Chart Example An example of a simple chart is shown below:



- The above chart is a simple Column Chart depicting the company's sales of ice cream products on different days of the week. With just a glance of the same, the user can identify the week's highest and lowest sales day.
- Charts can simplify data, categorize them into easy-to-understand and analyze formats, and find its excessive usage in a business where data is presented using different charts.
- A few types of charts are,
 - Vertical bar charts
 - Historical bar charts
 - Stacked bar charts
 - Histograms
 - The Pie Chart in excel
 - Line chart
 - Area Charts in Excel

There are many more chart types. However, based on the user requirement, the type of charts can be applied and generated to display the data graphically.

Experiment No:5

Q5. Cleaning Data with Text Functions: use of UPPER and LOWER, TRIM function, Concatenate.

Excel Data Cleaning is a significant skill that all Business and Data Analysts must possess. In the current era of data analytics, everyone expects the accuracy and quality of data to be of the highest standards. A major part of Excel Data Cleaning involves the elimination of blank spaces, incorrect, and outdated information.

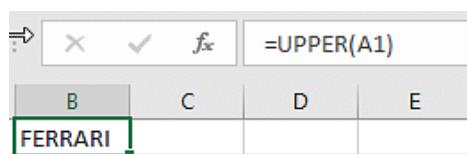
Change Case - Lower/Upper

You can manipulate the data in the Excel worksheet in terms of character cases as per the requirements. To apply case changes, you can follow the following steps.

Select the table or columns that need the case to be changed, as shown below.

	A
1	Ferrari
2	Lamborghini
3	Toyota
4	Tesla
5	Honda
6	Ford
7	Chevrolet
8	Dodge
9	Toyota
10	Audi
11	Mercedes

Select the cell next to the column and apply the formula as per the requirement, as shown below.



=UPPER(cell address) - for Upper case conversion

=LOWER(cell address) - for Lower case conversion

Now, you can drag the cell can to the last row, as shown below.

	A	B
1	Ferrari	FERRARI
2	Lamborghini	LAMBORGHINI
3	Toyota	TOYOTA
4	Tesla	TESLA
5	Honda	HONDA
6	Ford	FORD
7	Chevrolet	CHEVROLET
8	Dodge	DODGE
9	Toyota	TOYOTA
10	Audi	AUDI
11	Mercedes	MERCEDES
12		

The final data table will appear as shown below.

	A	B
1	Ferrari	FERRARI
2	Lamborghini	LAMBORGHINI
3	Toyota	TOYOTA
4	Tesla	TESLA
5	Honda	HONDA
6	Ford	FORD
7	Chevrolet	CHEVROLET
8	Dodge	DODGE
9	Toyota	TOYOTA
10	Audi	AUDI
11	Mercedes	MERCEDES

TRIM Function

The TRIM function is used to eliminate excess spaces and tab spaces in the Excel worksheet cells. The excessive blank spaces and tab spaces make the data hard to understand. Using the "TRIM" function can eliminate these excessive blank spaces.

Select the data cells with excessive blank spaces and tab spaces. Now, select a new cell adjacent to the first cell.

Apply the TRIM() function and drag the cell as shown below.

	A
1	Hi, Welcome to Data Analytics
2	In Excel
3	This chapter
4	is based
5	on TRIM () Method

It shows the final data after the elimination of the excess space as follows.

	A	B
1	Hi, Welcome to Data Analytics	Hi, Welcome to Data Analytics
2	In Excel	In Excel
3	This chapter	This chapter
4	is based	is based
5	on TRIM () Method	on TRIM () Method

How to Use Concatenate in Excel? [with Syntax and Examples]

The word CONCATENATE means to join or combine. The CONCATENATE function in Excel is used to combine the text from different cells into one cell.

Excel CONCATENATE Function

The Excel CONCATENATE function is used to join up to 30 text items and return the result as a text.

The Excel Concatenate formula is as follows:

=CONCATENATE (text1, text2, [text3], ...)

How to Combine Data Using the CONCAT Function

- Choose a cell for the combined data to be placed.
- Please type =CONCAT(.
- Choose the cell you would like to combine first.
- Add spaces, commas, or other text. Use quotation marks to separate the cells you are combining.
- Enter the formula within parenthesis. =CONCAT(A2, " Family").

Concatenating the Values of Several Cells

The simple formula to CONCATENATE the values of two cells A2 and B2 are as follows:

=CONCATENATE(A2,B2)

The values will be combined without any delimiters.

To separate the values with space, use “ “.

=CONCATENATE(A3, " ", B3)

	A	B	C
1	TEXT1	TEXT2	RESULT
2	David	Brooks	DavidBrooks
3	Maria	Hill	Maria Hill
4			

Concatenating a Text String and a Cell Value

The Excel CONCATENATE function is not only limited to joining cell value. You can use the function to join a cell value and a string as well. For example:

```
=CONCATENATE(A2, " ", B2, " SIMPLILEARN")
```

C2	A	B	C	D	E
	TEXT1	TEXT2	RESULT		
1	TEXT1	TEXT2	RESULT		
2	Welcome	To	Welcome To SIMPLILEARN		
3					

Concatenating a Text String and Formula Calculated Value

You can also concatenate a text string and a formula calculated value.

For example, you can use the following formula to return the current date:

```
=CONCATENATE("Today is ",TEXT(TODAY(), "dd-mmm-yy"))
```

C2	A	B	C	D	E	F
	TEXT1	TEXT2	RESULT			
1	TEXT1	TEXT2	RESULT			
2			Today is 17-Dec-20			
3						

How to Combine Data With the Ampersand Symbol (&)((just for reference))

Ampersand (&) calculation operators make it easy to join text items without requiring a function to be used.

1. Choose the cell where you want to place the combined data.
2. Type an equal sign (=) in that cell.
3. Select the first cell that you want to combine.
4. Type the ampersand symbol (&).
5. Enclose a space within quotation marks (" ").
6. Select the next cell that you want to combine.
7. Press the enter key.
8. An example formula could be "=A2&" "&B2".

Remember to adapt the cell references (A2, B2) according to your specific data.

Important Points to Remember((just for reference))

You should follow some rules to ensure that the CONCATENATE function always delivers the correct result.

- There should be at least one “text” argument in the CONCATENATE function for it to work.
- If the CONCATENATE function's arguments are invalid, the formula returns a #VALUE! Error.
- The result of the CONCATENATE function is always a text string, even when all the source values are numbers.
- Concatenate Cells With Space, Comma, and Other Characters

In the worksheet, you may require to join the values in a way that will include commas, spaces, or various punctuation marks. To do that, follow the syntax mentioned below.

Concatenating two cells with space:

=CONCATENATE(A2, " ", B2)

Concatenating two cells with a comma:

=CONCATENATE(A3, ", ", B3)

Concatenating two cells with space:

=CONCATENATE(A4, " - ", B4)

C4				=CONCATENATE(A3, "- ", B3)
A	B	C		
1	TEXT1	TEXT2	RESULT	
2	Welcome To	SIMPLILEARN	Welcome To SIMPLILEARN	
3	Welcome To	SIMPLILEARN	Welcome To, SIMPLILEARN	
4	Welcome To	SIMPLILEARN	Welcome To-SIMPLILEARN	

Concatenate Columns in Excel

Concatenating the whole column at once is very easy. Just enter the formula in the first cell and then copy it down to the other cells by dragging the fill handle (the small square that appears at the lower right corner of the selected cells).

C2				=CONCATENATE(A2, " ",B2)
A	B	C		
1	First Name	Last Name	Full Name	
2	Sean	Brook	Sean Brook	
3	Maria	Hill	Maria Hill	
4	Jeremy	Renner	Jeremy Renner	
5	Chris	Brown	Chris Brown	
6	Daniel	Craig	Daniel Craig	
7	James	Anderson	James Anderson	
8				

Experiment No:6

Q6. Cleaning Data Containing Date and Time Values: use of DATEVALUE function, DATEADD and DATEDIF, TIMEVALUE functions.

What is the DATEVALUE Function?

The DATEVALUE Function^[1] is categorized under Excel Date/Time functions.

When doing financial analysis, we often need to import files from another source, which can be in PDF, text, or csv file format. The DATEVALUE function helps convert dates imported from external sources that are in text format to a proper date format recognizable by Excel for further analysis.

Formula

=DATEVALUE(date_text)

The DATEVALUE function includes the following arguments:

Date_text – This is a required argument. It is the text that represents a date in an Excel date format, or a reference to a cell that contains text that represents a date in an Excel date format. For example, “1/30/2017” or “30-Jan-2017” are text strings within quotation marks that represent dates.

How to use the DATEVALUE Function in Excel?

To understand the uses of this function, let's consider a few examples:

Example 1

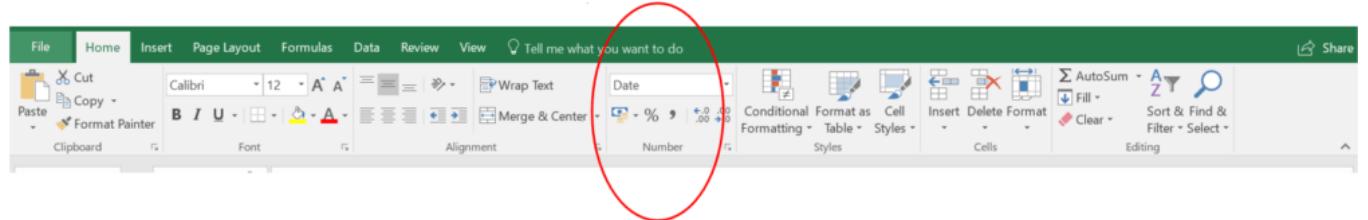
Suppose we have been given following dates in text format. We shall use this function to convert the different text representations of dates given to us.

D5		=DATEVALUE("01/01/2017")		
A	B	C	D	E
1				
2		DATEVALUE Function		
3				
4	Data	Formula used		Result
5	01/01/2017	DATEVALUE("01/01/2017")		42736
6	01/01/17	DATEVALUE("01/01/17")		42736
7	01/01	DATEVALUE("01/01")		43101
8	01/01/2029	DATEVALUE("01/01/2029")		47119
9	01/01/30	DATEVALUE("01/01/30")		10959

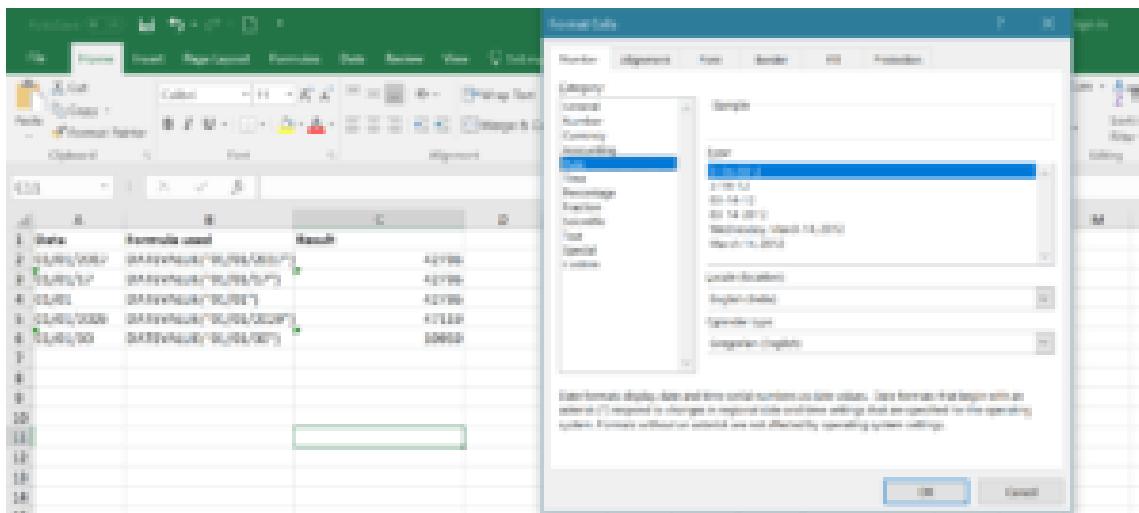
The DATEVALUE function in Excel, when interpreting the supplied date_text argument, follows simple rules to interpret the year. The rules are:

- When we provide just a date and month, then the returned date will return the current year. This function will take the current year from the computer's system clock.
- For this function, the default settings for the year are the one- and two-digit years interpreted as follows:
 - The numbers 0 through to 29 are interpreted as the years 2000 to 2029;
 - The numbers 30 through to 99 are interpreted as the years 1930 to 1999.

As seen above, when we provide 01/01/30, this function interpreted it as 1930. The results, as shown above, are returned as numbers due to the “General” formatting type. So, the results displayed above show the underlying numeric value for the resulting dates. We need to change the formatting to DATE to get dates in the result column. For this, we can select the cell or range of cells and, on the Home tab, click on number format and select Date instead of Number, as shown below:



The other way to do it is to select a cell or a range of cells with the numbers that we want to convert to dates and then press Ctrl+1 to open the Format Cells dialog. On the Number tab, choose Date and select the desired date format under Type and click OK.



The result we get is as follows:

	A	B	C	D	E
1	DATEVALUE Function				
2	Data	Formula used	Result		
4	01/01/2017	DATEVALUE("01/01/2017")	1/1/2017		
5	01/01/17	DATEVALUE("01/01/17")	1/1/2017		
6	01/01	DATEVALUE("01/01")	1/1/2018		
7	01/01/2029	DATEVALUE("01/01/2029")	1/1/2029		
8	01/01/30	DATEVALUE("01/01/30")	1/1/1930		
9					

DATEADD FUNCTION

How to add / subtract months to date in Excel

If you want to add or subtract a certain number of whole months to a date, you can employ either the DATE or EDATE function, as demonstrated below.

Example 1. Add months to a date with Excel DATE function

Taking a list of dates in column A for example, type the number of dates you want to add (positive number) or subtract (negative number) in some cell, say C2.

Enter the following formula in cell B2 and then drag the corner of the cell all the way down to copy the formula to other cells:

=DATE(YEAR(A2), MONTH(A2) + \$C\$2, DAY(A2))

	A	B	C
1	Date	Result	Month to add / subtract
2	3-Mar-11	3-May-11	2
3	1-Apr-13	1-Jun-13	
4	12-Jan-09	12-Mar-09	
5	9-Aug-10	9-Oct-10	
6	18-Sep-11	18-Nov-11	
7	22-Nov-12	22-Jan-13	

The logic behind the formula is obvious and straightforward. The DATE(year, month, day) function takes the following arguments:

- the **year** of the date in cell A2;
- the **month** of the date in A2 + the number of months you specified in cell C2, and
- the **day** of the date in A2.

If you type a negative number in C2, the formula will subtract months instead of adding them:

	A	B	C
1	Date	Result	Month to add / subtract
2	3-Mar-11	3-Jan-11	-2
3	1-Apr-13	1-Feb-13	
4	12-Jan-09	12-Nov-08	
5	9-Aug-10	9-Jun-10	
6	18-Sep-11	18-Jul-11	
7	22-Nov-12	22-Sep-12	

Naturally, nothing prevents you from typing the minus sign directly in the formula to subtract months from a date:

=DATE(YEAR(A2), MONTH(A2) - \$C\$2, DAY(A2))

And of course, you can type the number of month to add or subtract in the formula instead of referring to a cell:

=DATE(YEAR(date), MONTH(date) + N months, DAY(date))

The real formulas could look similar to these:

- Add months to date: =DATE(YEAR(A2), MONTH(A2) + 2, DAY(A2))
- Subtract months from date: =DATE(YEAR(A2), MONTH(A2) - 2, DAY(A2))

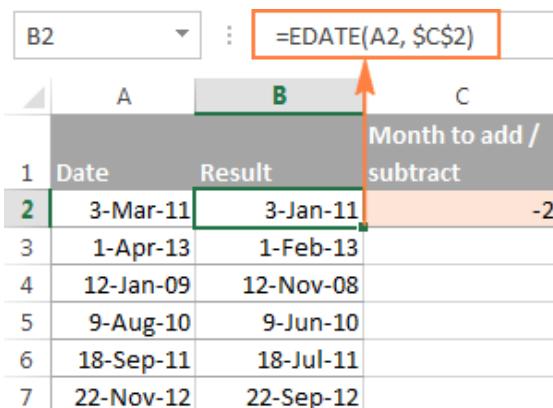
Example 2. Add or subtract months to a date with Excel EDATE

Microsoft Excel provides a special function that returns a date that is a specified number of months before or after the start date - the EDATE function. It is available in all versions of Excel 2007 and higher.

In your **EDATE(start_date, months)** formulas, you supply the following 2 arguments:

- **Start_date** - the start date from which to count the number of months.
- **Months** - the number of months to add (a positive value) or subtract (a negative value).

The following formula used on our column of dates yields exactly the same results as the DATE function in the previous example:



	B2	=EDATE(A2, \$C\$2)	
1	Date	Result	Month to add / subtract
2	3-Mar-11	3-Jan-11	-2
3	1-Apr-13	1-Feb-13	
4	12-Jan-09	12-Nov-08	
5	9-Aug-10	9-Jun-10	
6	18-Sep-11	18-Jul-11	
7	22-Nov-12	22-Sep-12	

When using the EDATE function, you can also specify the start date and the number of month to add / subtract directly in the formula. Dates should be entered by using the DATE function or as results of other formulas. For example:

- To **add** months in Excel:

=EDATE(DATE(2015,5,7), 10)

The formula adds 10 months to 7-May-2015.

- To **subtract** months in Excel:

=EDATE(TODAY(), -10)

The formula subtracts 10 months from today's date.

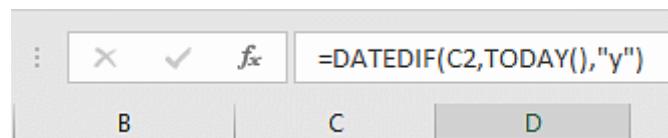
DATEDIF Function in Excel

The DATEIF function in Excel can be used for multiple purposes. It can be used to find the difference between two specific days, generate a valid date after a particular period, calculate anniversary dates and much more.

Let's try to implement DATEIF function in Excel through a practical example.

The following example is implemented on a small database containing employee details. The DATEIF function is called and employed to calculate the current age of all the employees based on their date of birth.

The following syntax is implemented in the formula bar of the Excel Sheet. The next image shows the real-time results.



The final data table is displayed as shown below.

	A	B	C	D
1	Employee ID	Employee Name	Employee DOB	Employee Age
2	7021	John	15-Aug-96	25
3	7022	Jimmy	17-Sep-95	25
4	7023	Rachel	28-Apr-94	27
5	7024	Rock	03-Aug-95	26
6	7025	Jennifer	24-Jul-97	24
7				

TIMEVALUE FUNCTION

The Excel TIMEVALUE function converts a time represented as text into a proper Excel time. For example, the formula =TIMEVALUE("9:00 AM") returns 0.375, the numeric representation of 9:00 AM in Excel's time system. Numeric time values are more useful than text since they can be directly manipulated with formulas and pivot tables.

Syntax

=TIMEVALUE(time_text)

- *time_text* - A date and/or time in a text format recognized by Excel.

How to use?

Sometimes, times in Excel appear as text values that are not recognized properly as time. The TIMEVALUE function is meant to parse a time that appears as a **text value** into a valid Excel time. A **native Excel time** is more useful than text because it is a numeric value that can be **formatted** as time and directly manipulated in a formula.

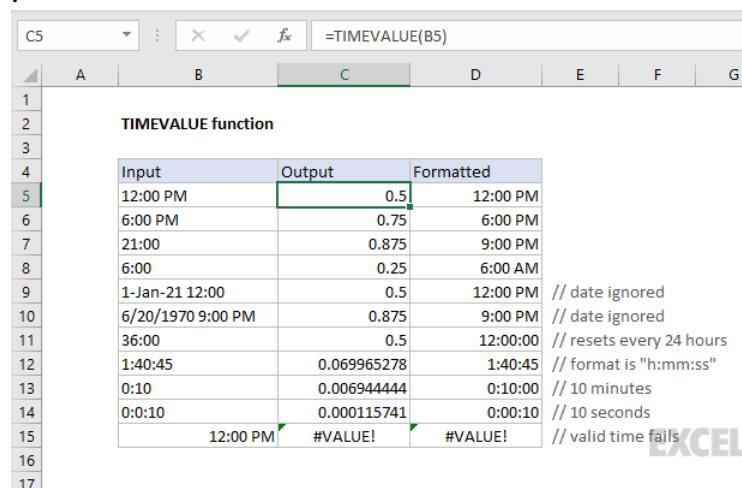
The TIMEVALUE function takes just one argument, called *time_text*. If *time_text* is a cell address, the value in the cell must be text. If *time_text* is entered directly into the formula it must be enclosed in double quotes (""). *Time_text* should be supplied in a text format that Excel can recognize, for example, "6:45 PM" or "18:45". TIMEVALUE ignores dates if present in a text string.

The TIMEVALUE function creates a time in serial number format from a date and/or time in an Excel text format. TIMEVALUE will return a decimal number between 0 and 0.99988426, representing 12:00:00 AM to 11:59:59 PM. Because the maximum value returned by TIMEVALUE is less than 1, hours will reset every 24 hours (like a clock).

Examples

The formulas below show the output from TIMEVALUE:

```
=TIMEVALUE("12:00") // returns 0.5  
=TIMEVALUE("12:00 PM") // returns 0.5  
=TIMEVALUE("18:00") // returns 0.75
```



A screenshot of Microsoft Excel demonstrating the TIMEVALUE function. The spreadsheet shows a table with three columns: Input, Output, and Formatted. The Input column contains various time-related values, and the Output column shows their corresponding decimal representations. The Formatted column shows the time as text. Row 5 shows 12:00 PM as 0.5 and 12:00 PM. Rows 6 and 7 show 6:00 PM and 21:00 respectively, both as 0.75 and 9:00 PM. Row 8 shows 6:00 as 0.25 and 6:00 AM. Row 9 shows 1-Jan-21 12:00 as 0.5 and 12:00 PM. Row 10 shows 6/20/1970 9:00 PM as 0.875 and 9:00 PM. Row 11 shows 36:00 as 0.5 and 12:00:00. Row 12 shows 1:40:45 as 0.069965278 and 1:40:45. Row 13 shows 0:10 as 0.006944444 and 0:10:00. Row 14 shows 0:0:10 as 0.000115741 and 0:00:10. Row 15 shows 12:00 PM as #VALUE! and #VALUE!. The table is titled 'TIMEVALUE function' in row 3. The formula =TIMEVALUE(B5) is shown in the formula bar above the table.

C5						
	X	✓	f _x	=TIMEVALUE(B5)		
1	A	B	C	D	E	F
TIMEVALUE function						
4	Input	Output	Formatted			
5	12:00 PM	0.5	12:00 PM			
6	6:00 PM	0.75	6:00 PM			
7	21:00	0.875	9:00 PM			
8	6:00	0.25	6:00 AM			
9	1-Jan-21 12:00	0.5	12:00 PM	// date ignored		
10	6/20/1970 9:00 PM	0.875	9:00 PM	// date ignored		
11	36:00	0.5	12:00:00	// resets every 24 hours		
12	1:40:45	0.069965278	1:40:45	// format is "h:mm:ss"		
13	0:10	0.006944444	0:10:00	// 10 minutes		
14	0:0:10	0.000115741	0:00:10	// 10 seconds		
15	12:00 PM	#VALUE!	#VALUE!	// valid time fails		
16						
17						

Experiment No:7

7. ConditionalFormatting:formatting,parsing, andhighlightingdatainspreadsheetsduringdata analysis.

What is conditional formatting in Excel?

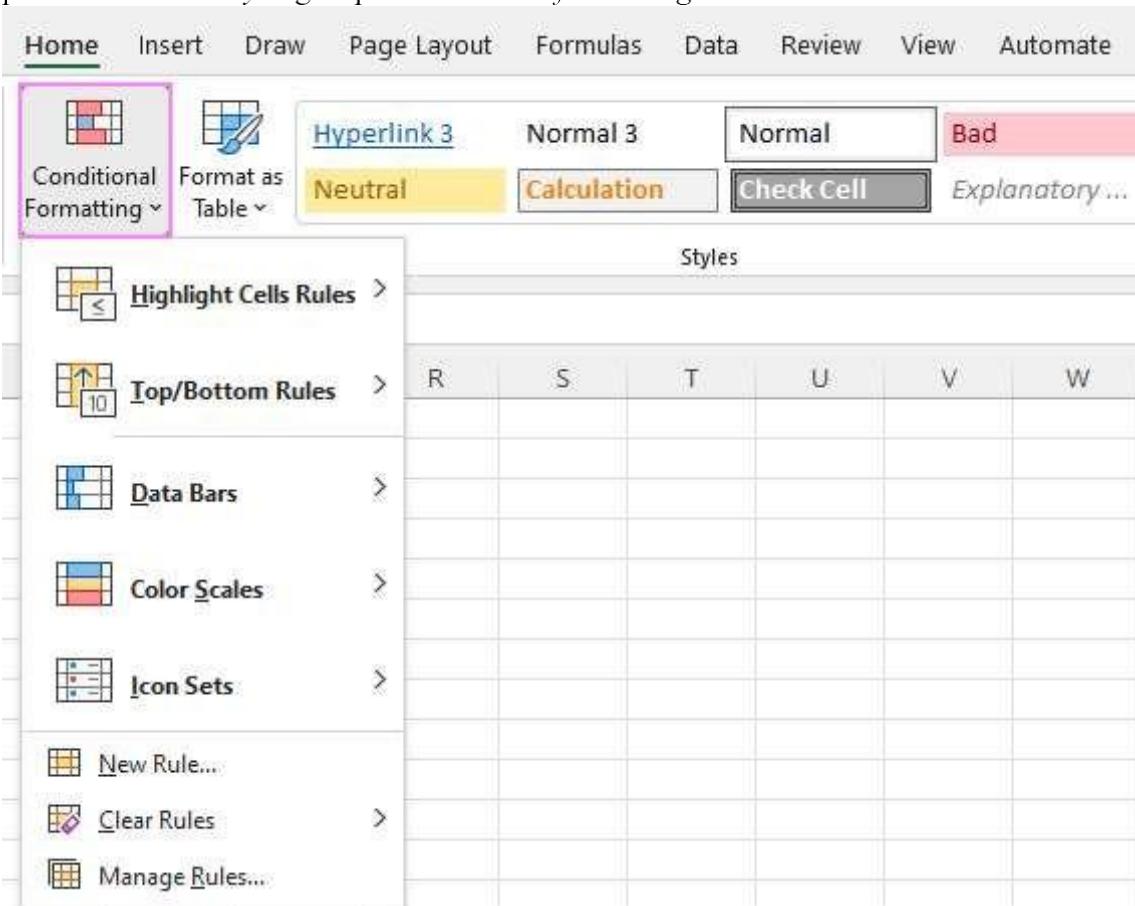
Excel Conditional Formatting is used to apply certain formatting to data that meets one or more conditions. Just like usual cell formatting, it lets you highlight and differentiate your data in various ways by changing cells' fill color, font color, border styles, etc. The difference is that it is more flexible and dynamic - when the data changes, conditional formats get updated automatically to reflect the changes.

Conditional formatting can be applied to individual cells or entire rows based on the value of the formatted cell itself or another cell. To conditionally format your data, you can utilize **preset rules** such as [Highlights](#), [Data Bars](#) and [Icon Sets](#) or create **custom rules** where you define when and how the selected cells should be

	A	B	C	D	E	F	G	H
1	Excel Conditional Formatting							
2	Month	Price	Month	Price	Month	Price	Month	Price
3	Jan	\$120.00	Jan	\$120.00	Jan	★ \$120.00	Feb	☆ \$60.00
4	Feb	\$60.00	Feb	\$60.00	Feb	☆ \$60.00	Mar	★ \$80.00
5	Mar	\$80.00	Mar	\$80.00	Mar	★ \$80.00	Apr	★ \$102.49
6	Apr	\$102.49	Apr	\$102.49	Apr	★ \$102.49	May	★ \$70.00
7	May	\$70.00	May	\$70.00	May	★ \$70.00	Jun	★ \$99.12
8	Jun	\$99.12	Jun	\$99.12	Jun	★ \$99.12	Jul	☆ \$54.00
9	Jul	\$54.00	Jul	\$54.00	Jul	☆ \$54.00	Aug	★ \$105.79
10	Aug	\$105.79	Aug	\$105.79	Aug	★ \$105.79	Sep	☆ \$45.00
11	Sep	\$45.00	Sep	\$45.00	Sep	☆ \$45.00	Oct	★ \$70.00
12	Oct	\$70.00	Oct	\$70.00	Oct	★ \$70.00	Nov	★ \$97.52
13	Nov	\$97.52	Nov	\$97.52	Nov	★ \$97.52	Dec	★ \$105.94
14	Dec	\$105.94	Dec	\$105.94	Dec	★ \$105.94		

Where is conditional formatting in Excel?

In all versions of Excel 2010 through Excel 365, conditional formatting resides in the same place: Home tab > Styles group > Conditional formatting.



Now that you know where to find conditional formatting in Excel, let's move on and see how you can leverage it in your daily work to make more sense of the project you are currently working on.

For our examples, we will use Excel 365, which seems to be the most popular version these days. However, the options are essentially the same in all Excels, so you won't have any problems with following no matter what version is installed on your computer.

How to use conditional formatting in Excel

Data Analytics with Excel: BCS358A

To truly leverage the capabilities of conditional format, you need to learn how to utilize various rule types. The good news is that whatever rule you are going to apply, it defines the two key things:

- What cells are covered by the rule.
- What condition should be met.

So, here's how you use Excel conditional formatting:

1. In your spreadsheet, select the cells you want to format.
2. On the *Home* tab, in the *Styles* group, click *Conditional Formatting*.

3. From a set of inbuilt rules, choose the one that suits your purpose.

As an example, we are going to highlight values less than 0, so we click *Highlight Cells Rules > Less Than...*

The screenshot shows the Microsoft Excel ribbon with the 'Conditional Formatting' button selected. A dropdown menu is open, showing various options like 'Highlight Cells Rules', 'Top/Bottom Rules', 'Data Bars', etc. The 'Less Than...' option under 'Highlight Cells Rules' is highlighted with a pink box. Below the dropdown, a table titled 'Local weather, °F' is displayed, showing temperature data for May 2021 and 2022, and the percentage change between them.

Date	2021	2022	Change
1-May	78	71	-8.97%
2-May	70	76	8.57%
3-May	71	66	-7.04%
4-May	65	65	0.00%
5-May	70	75	7.14%
6-May	71	70	-1.41%
7-May	69	56	-18.84%
8-May	59	58	-1.69%
9-May	63	57	-9.52%
10-May	83	87	4.82%
11-May	82	84	2.44%

Than...

4. In the dialog window that appears, enter the value in the box on the left and choose the desired format from the drop-down list on the right (default is *Light Red Fill with Dark Red Text*).

When done, Excel will show you a preview of the formatted data. If you are happy with the preview, click *OK*.

	C	D	E	F	G	H	I
	Local weather, °F						
	Date	2021	2022	Change			
1-May		78	71	-8.97%			
2-May		70	76	8.57%			
3-May		71	66	-7.04%			
4-May		65	65	0.00%			
5-May		70	75	7.14%			
6-May		71	70	-1.41%			
7-May		69	56	-18.84%			
8-May		59	58	-1.69%			
9-May		63	57	-9.52%			
10-May		83	87	4.82%			
11-May		82	84	2.44%			

Less Than

Format cells that are LESS THAN:

0 with Light Red Fill with Dark Red Text

OK Cancel

5.

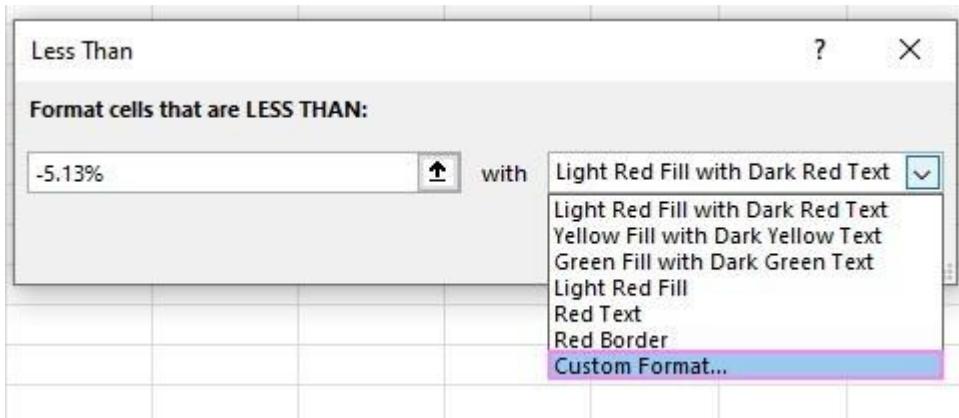
In a similar manner, you can use any other rule type that is more appropriate for your data, such as:

- Greater than or equal to
- Between two values
- Text that contains specific words or characters
- Date occurring in a certain range
- Duplicate values
- Top/bottom N numbers

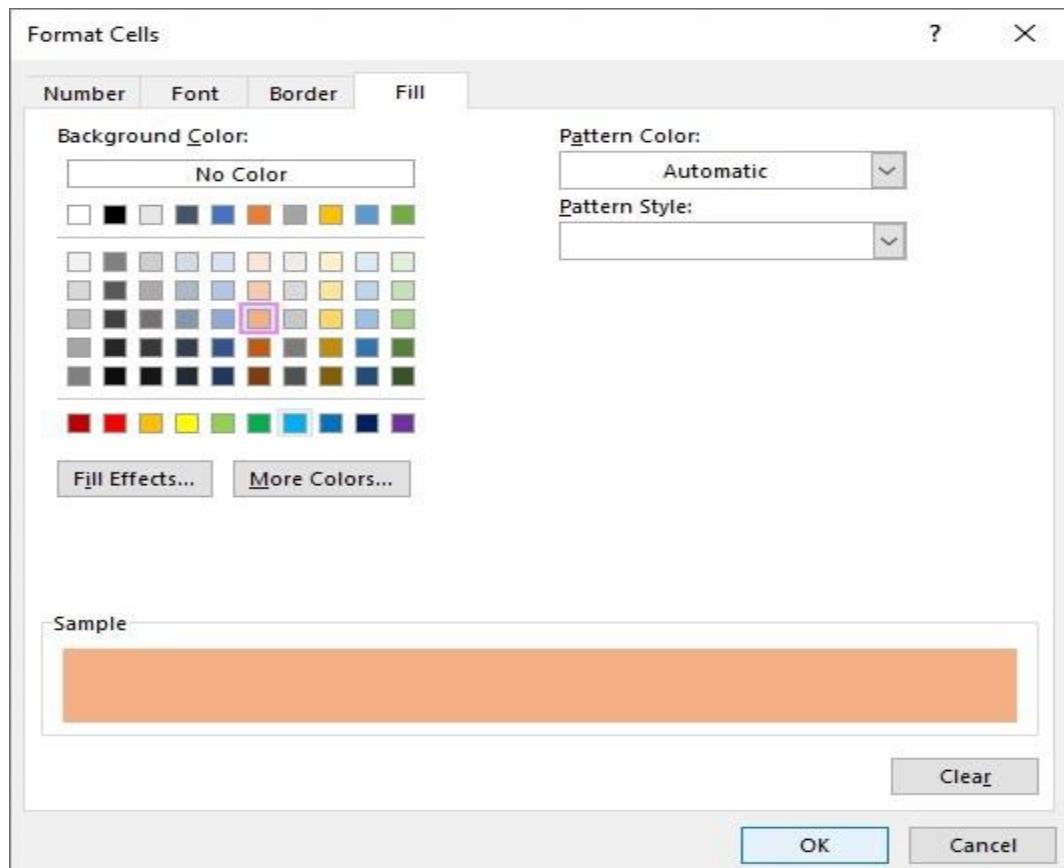
How to use a pre-set rule with custom formatting

If none of the predefined formats suits you, you can choose any other colors for cells' background, font or borders. Here's how:

1. In the pre-set rule dialog box, from the drop-down list on the right, pick **Custom Format...**



2. In the *Format Cells* dialog window, switch between the *Font*, *Border* and *Fill* tabs to choose the desired font style, border style and background color, respectively. As you do this, you will immediately see a preview of the selected format. When done,

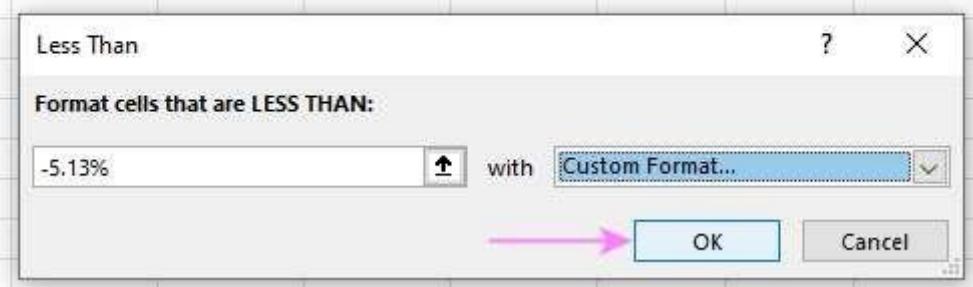


3. k

OK.4.

5.Click OK on more time to close the previous dialog window and apply the custom formatting of

C	D	E	F	G	H	I
Local weather, °F						
Date	2021	2022	Change			
1-May	78	71	-8.97%			
2-May	70	76	8.57%			
3-May	71	66	-7.04%			
4-May	65	65	0.00%			
5-May	70	75	7.14%			
6-May	71	70	-1.41%			
7-May	69	56	-18.84%			
8-May	59	58	-1.69%			
9-May	63	57	-9.52%			
10-May	83	87	4.82%			
11-May	82	84	2.44%			



your choice.

Tips:

- If you want **more colors** than the standard palette provides, click the *More Colors...* button on the *Fill* or *Font* tab.
- If you wish to apply a **gradient background color**, click the *Fill Effects* button on the *Fill* tab and choose the desired options.

How to create a new conditional formatting rule

If none of the pre-set rules meets your needs, you can create a new one from scratch. To get it done, follow these steps:

1. Select the cells to be formatted and click *ConditionalFormatting > New Rule...*.

The screenshot shows the Microsoft Excel ribbon with the 'Conditional Formatting' button highlighted. A pink arrow points from the 'Conditional Formatting' button in the ribbon to the 'New Rule...' option in the dropdown menu. Below the ribbon, a table is displayed with the 'Change' column selected. The table has columns for Date, 2021, 2022, and Change. The data in the Change column is as follows:

Date	2021	2022	Change
1-May	78	71	-8.97%
2-May	70	76	8.57%
3-May	71	66	-7.04%
4-May	65	65	0.00%
5-May	70	75	7.14%
6-May	71	70	-1.41%
7-May	69	56	-18.84%
8-May	59	58	-1.69%
9-May	63	57	-9.52%
10-May	83	87	4.82%
11-May	82	84	2.44%

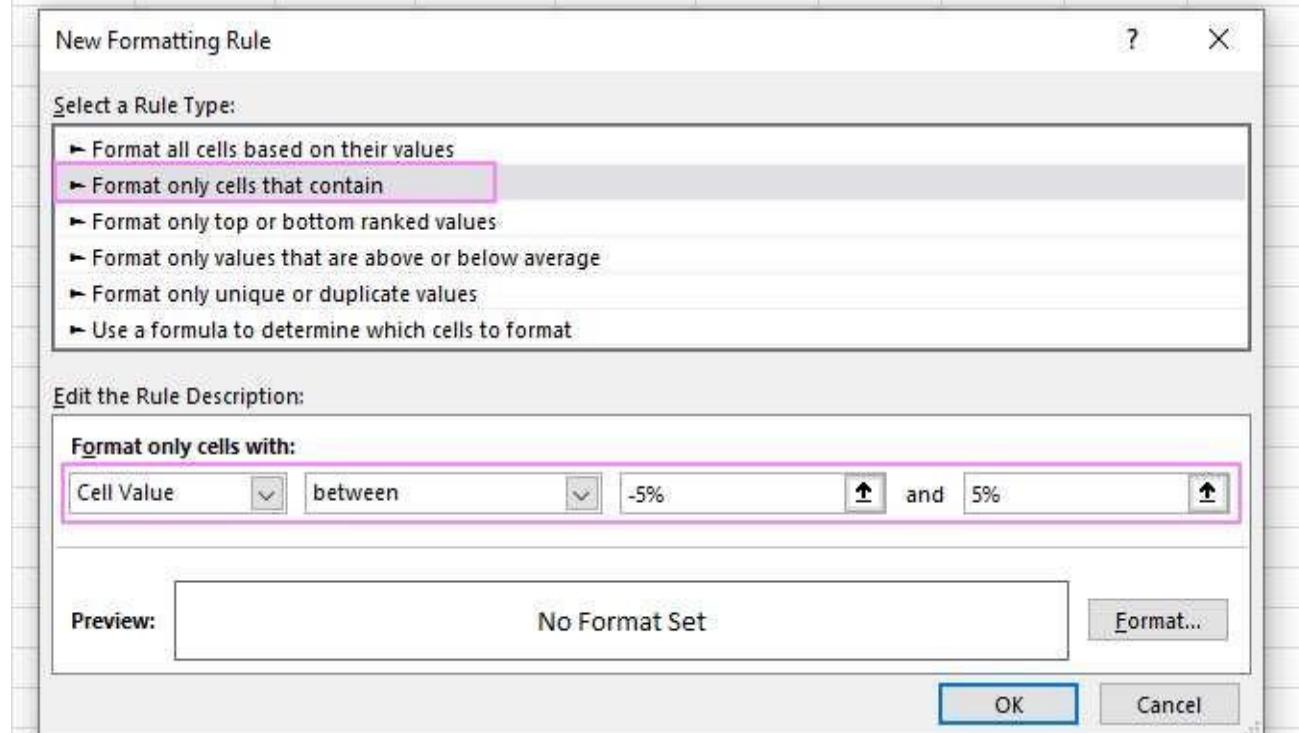
2. In the *New Formatting Rule* dialog box that opens, select the rule type.

For example, to format cells with percent change less than 5% in either direction, we choose *Format only cells that contain*.

Data Analytics with Excel: BCS358A

cells that contain, and then configure the rule like shown in the screenshot below:

Date	2021	2022	Change
1-May	78	71	-8.97%
2-May	70	76	8.57%
3-May	71	66	-7.04%
4-May	65	65	0.00%
5-May	70	75	7.14%
6-May	71	70	-1.41%
7-May	69	56	-18.84%
8-May	59	58	-1.69%
9-May	63	57	-9.52%
10-May	83	87	4.82%
11-May	82	84	2.44%



3. Click the *Format...* button, and then choose the *Fill* or *Font* color you want.

4. Click **OK** twice to close both dialog windows and your conditional formatting is done!

The screenshot shows a Microsoft Excel spreadsheet titled "Local weather, °F". The table has columns for Date, 2021, 2022, and Change. The "Change" column uses conditional formatting where values between -0.05 and 0.05 are highlighted in green. A context menu is open over the "Change" column, showing options like Wrap, Merge, and other data analysis tools.

Edit Formatting Rule

Select a Rule Type:

- Format all cells based on their values
- Format only cells that contain** (selected)
- Format only top or bottom ranked values
- Format only values that are above or below average
- Format only unique or duplicate values
- Use a formula to determine which cells to format

Edit the Rule Description:

Format only cells with:

Cell Value: between =-0.05 and =0.05

Preview: AaBbCcYyZz (highlighted in green)

Buttons: OK, Cancel

Excel conditional formatting based on another cell

In the previous examples, we highlighted cells based on "hardcoded" values. However, in some cases it makes more sense to base your condition on a value in another cell. The advantage of this approach is that irrespective of how the cell value changes in future, your formatting will adjust automatically to respond to the change.

As an example, let's highlight prices in column B that are greater than the threshold price in cell D2. To accomplish this, the steps are:

- Click **ConditionalFormatting > HighlightCellsRules > GreaterThan...**
- In the dialog box that pops up, place the cursor in the text box on the left (or click the **Collapse Dialog icon**), and select cell D2.
- When done, click **OK**.

As a result, all the prices higher than the value in D2 will get highlighted with the selected color:

DataAnalyticswithExcel:BCS358A

A	B	C	D	E	F	G	H	I
1	Month	Price	Threshold price					
2	Jan	\$103.87	\$99.99					
3	Feb	\$98.59						
4	Mar	\$100.46						
5	Apr	\$102.49						
6	May	\$98.19						
7	Jun	\$99.12						
8	Jul	\$99.16						
9	Aug	\$104.79						
10	Sep	\$100.26						
11	Oct	\$99.53						
12	Nov	\$97.52						
13	Dec	\$105.94						
14								

That is the simplest case of conditional formatting based on another cell. More complex scenarios may require the use of formulas. And you can find several examples of such formulas along with the step-by-step instructions here:

Apply multiple conditional formatting rules to same cells

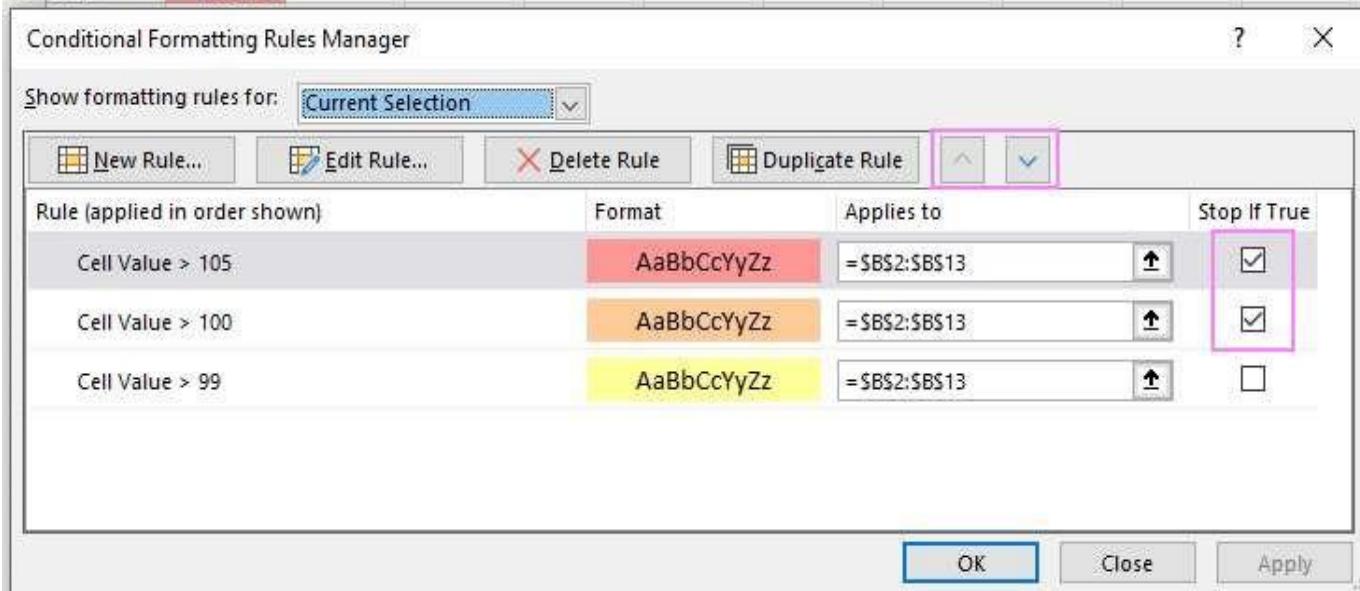
When using conditional formats in Excel, you are not limited to only one rule per cell. You can apply as many rules as your business logic requires.

For example, you can create 3 rules to highlight prices higher than \$105 in red, higher than \$100 in orange, and higher than \$99 in yellow. **For the rules to work correctly, you need to arrange them in the right order.** If the "greater than 99" rule is placed first, then only the yellow formatting will be applied because the other two rules won't have a chance to be triggered - obviously, any number that is higher than 100 or 105 is also higher than 99 :)

To re-arrange the rules, this is what you need to do:

1. Select any cell in your dataset covered by the rules.
2. Open the *Rules Manager* by clicking *ConditionalFormatting > Manage Rules...*
3. Click the rule that needs to be applied first, and then use the upward arrow to move it to top. Do the same for the second-in-priority rule.
4. Select the *Stop If True* checkbox next to all but the last rule because you don't want the subsequent rules to be applied when the prior condition is met.

	A	B	C	D	E	F	G	H	I	J	K
1	Month	Price									
2	Jan	\$103.87									
3	Feb	\$98.59									
4	Mar	\$100.46									
5	Apr	\$102.49									
6	May	\$98.19									
7	Jun	\$99.12									
8	Jul	\$99.16									
9	Aug	\$105.79									
10	Sep	\$100.26									
11	Oct	\$99.53									
12	Nov	\$97.52									
13	Dec	\$105.94									



What is Stop If True in Excel conditional formatting?

The Stop If True option in conditional formatting prevents Excel from processing other rules when a condition in the current rule is met. In other words, if two or more rules are set for the same cell and Stop If True is enabled for the first rule, the subsequent rules are disregarded after the first rule is activated.

In the example above, we have already used this option to ignore subsequent rules when the first-in-priority rule applies. That usage is quite evident. And here are another couple of examples where the use of the Stop If True function is not so obvious but extremely helpful:



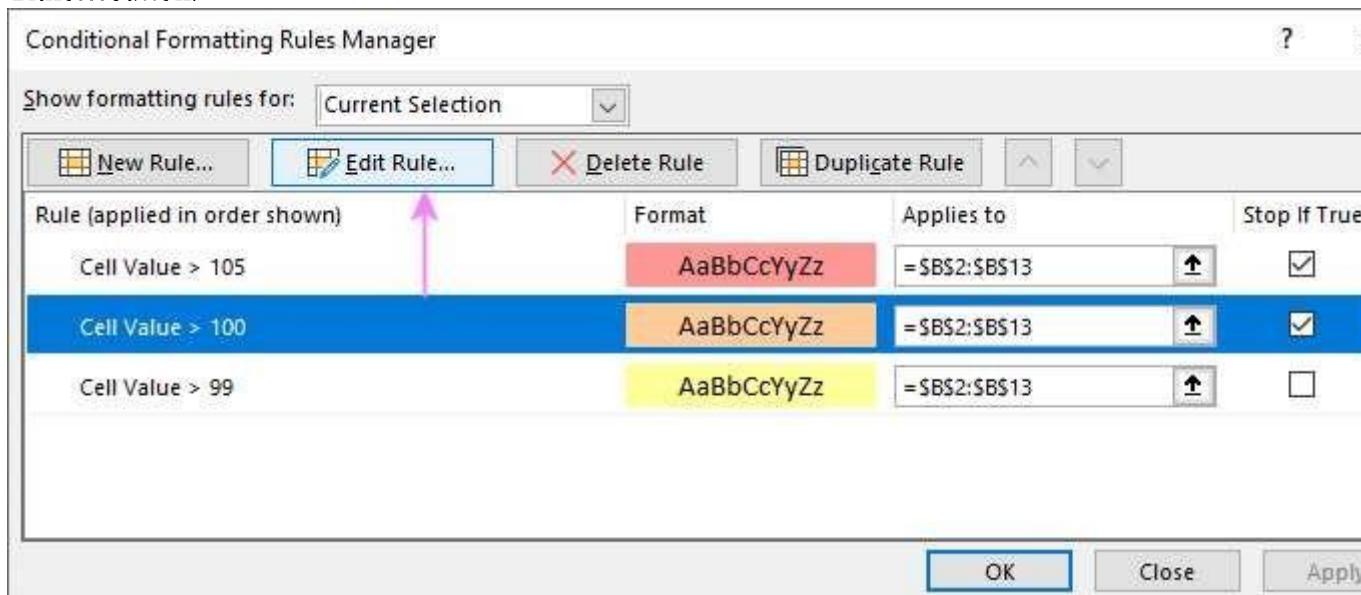
To edit Excel conditional formatting rules

To make some changes to an existing rule, proceed in this way:

- Select any cell to which the rule applies and click Conditional Formatting > Manage Rules...

2.

In the *Rules Manager* dialog box, click the rule you want to modify, and then click the **Edit Rule...** button.



3. In the *Edit Formatting Rule* dialog window, make the required changes and click **OK** to save the edits.

That dialog window looks very similar to the *New Formatting Rule* dialog box used for creating a new rule, so you won't have any difficulties with it.

Tip. If you don't see the rule you want to edit, then select **This Worksheet** from the *Show formatting rules for* dropdown list at the top of the *Rules Manager* dialog box. This will display the list of all the rules in your worksheet.

How to copy Excel conditional formatting

To apply a conditional format you've created earlier to other data, you won't need to re-create a similar rule from scratch. Simply use [Format Painter](#) to copy the existing conditional formatting rule(s) to another dataset. Here's how:

1. Click any cell with the formatting you want to copy.
2. Click **Home > Format Painter**. This will change the mouse pointer to a paintbrush.

Tip. To copy the formatting to multiple non-contiguous cells or ranges, double-click *Format Painter*.

What is parsing data?

Parsing data is changing a string of data into another format. The most common way people parse data is by changing a single string of data into two or more strings using a series of rules. Other ways that you can parse data include:

- Changing the data from a coding language to plaintext
- Combining two or more strings into one string
- Converting mathematical symbols and formulas into plaintext
- Changing data from plaintext into a coding language, mathematical formula or data structure

Data Analytics with Excel: BCS358A

3. To paste the copied formatting, click on the first cell and drag the paintbrush down to the last cell in the range you want to format.

The screenshot shows a Microsoft Excel spreadsheet with two data sets. The first data set (A1:A13) has columns 'Month' and 'Price'. The second data set (E1:E13) also has columns 'Month' and 'Price'. The 'Price' column in both datasets uses conditional formatting based on the value. A pink arrow points from the 'Format Painter' button in the ribbon's 'Clipboard' group to the second dataset. Another pink arrow points from the second dataset back to the 'Format Painter' icon, indicating the process of applying the copied format.

4. When done, press Esc to stop using the paintbrush.

- 3-M 5. Select any cell in your new dataset, open the *Rules Manager* and check the copied rule(s). **Note.** If the copied conditional formatting uses a formula, you may need to adjust cell references in the formula after copying the rule.

How to delete conditional formatting rules

I've saved the easiest part for last:) To delete a rule, you can either:

- Open the *Conditional Formatting Rules Manager*, select the rule and click the **Delete Rule** button.

The screenshot shows the 'Conditional Formatting Rules Manager' dialog box. It lists three rules applied to the range \$B\$2:\$B\$13. The rules are: 'Cell Value > 105' (format AaBbCcYyZz), 'Cell Value > 100' (format AaBbCcYyZz), and 'Cell Value > 99' (format AaBbCcYyZz). The 'Delete Rule' button is highlighted with a pink arrow. The 'OK' button is at the bottom right.

DataAnalyticswithExcel:BCS358A

- Select the range of cells, click ConditionalFormatting > Clear Rules and choose the option that fits your needs.

The screenshot shows a Microsoft Excel spreadsheet with a table of monthly prices. The 'Price' column (D) has conditional formatting applied, with colors ranging from green for lower values to red for higher values. The 'Conditional Formatting' button in the ribbon is selected, opening a dropdown menu. The 'Clear Rules' option is highlighted with a pink arrow and a pink box around its submenu, which includes four choices: 'Clear Rules from Selected Cells', 'Clear Rules from Entire Sheet', 'Clear Rules from This Table', and 'Clear Rules from This PivotTable'.

	Month	Price
	Jan	\$96.70
	Feb	\$105.55
	Mar	\$95.77
	Apr	\$102.53
	May	\$97.64
	Jun	\$99.54
	Jul	\$95.99
	Aug	\$105.44
	Sep	\$102.76
	Oct	\$100.35
Date	Nov	\$105.36
1-Ma	Dec	\$97.96

This is how you do conditional formatting in Excel. Hopefully, these very simple rules we created were helpful to get a grasp of the basics. Below, you can find a few more tutorials that can help you understand the inner mechanics and expand conditional formatting in your spreadsheets far beyond its traditional uses.

ExcelforDataAnalysis

Data analysis with Excel is a common and accessible way for individuals and businesses to analyze and visualize data. Microsoft Excel provides a range of tools and functions for performing basic to advanced data analysis tasks. The software enables users to seamlessly import and organize data from various sources, facilitating a structured foundation for analysis. Data cleaning becomes an intuitive process with Excel's capabilities, allowing users to identify and rectify issues like missing values and duplicates. PivotTables, a hallmark feature, empower users to swiftly summarize and explore large datasets, providing dynamic insights through customizable cross-tabulations.

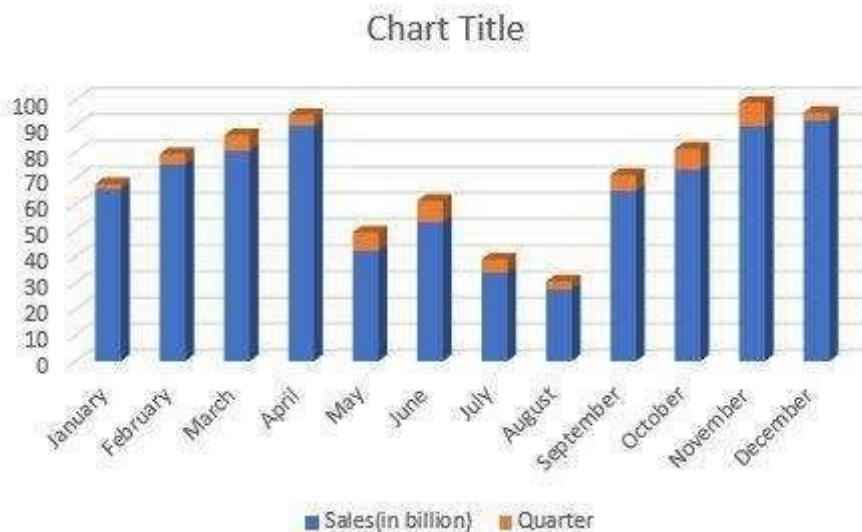
MethodsofDataAnalysisCharts

Any set of information may be graphically represented in a chart. A chart is a graphic representation of data that employs symbols to represent the data, such as bars in a bar chart or lines in a line chart. Excel has several different chart types available for you to choose from, or you can use the Excel Recommended Chart option to look at charts specifically made for your data and choose one of those. **Step 1: Select a table.** After that go to the **Insert tab** on the top of the ribbon then in the **charts group** select any chart. Here we are going to select a **3-D column chart**.

The screenshot shows the Microsoft Excel ribbon with the 'Insert' tab selected. A dropdown menu titled 'Recommended Charts' is open, showing options for 2-D Column, 3-D Column, 2-D Bar, and 3-D Bar charts. Below the dropdown, a table is visible with columns for 'Months' and 'Sales(in billion)'.

Months	Sales(in billion)
January	65.8
February	75.3
March	80.5
April	90.2
May	42.3
June	53.3
July	33.9
August	27.5
September	65.2
October	73.3
November	89.9
December	92

Step2: As you can see, the excel table has been converted to a 3-D column chart.



BarGraph

ConditionalFormatting

Patterns and trends in your data may be highlighted with the help of conditional formatting. To use it, write rules that determine the format of cells based on their values. In Excel for Windows, conditional formatting can be applied to a set of cells, an Excel table, and even a PivotTable report. To execute conditional formatting, adhere to the instructions listed below.

Step1: Select any column from the table. Here we are going to select a Quarter column. After that go to the home tab on the top of the ribbon and then in the styles group select conditional formatting and then in the highlight cells rule select Greater than an option.

Data Analytics with Excel: BCS358A

The screenshot shows a Microsoft Excel spreadsheet with data for months from January to December. The columns are labeled A (Months), B (Sales(in billion)), and C (Quarter). The 'Quarter' column contains values 2, 4, 6, 4, 7, 8, 5, 3, 6, 8, 9, and 3 respectively. The 'Conditional Formatting' dropdown menu is open, and the 'Greater Than...' option is highlighted.

Months	Sales(in billion)	Quarter
January	65.8	2
February	75.3	4
March	80.5	6
April	90.2	4
May	42.3	7
June	53.3	8
July	33.9	5
August	27.5	3
September	65.2	6
October	73.3	8
November	89.9	9
December	92	3

Step 2: Then a greater than dialog box appears. Here first write the quarter value and then select the color.

The screenshot shows the 'Greater Than' dialog box. It has a text input field containing '6' and a color preview box showing 'Green Fill with Dark Green Text'. There are 'OK' and 'Cancel' buttons at the bottom.

Step 3: As you can see in the excel table Quarter column change the color of the values that are greater than 6.

The screenshot shows the same Microsoft Excel spreadsheet as before, but now the 'Quarter' column is colored green for all rows where the value is greater than 6. The green color highlights the values 7, 8, 9, and 3.

Months	Sales(in billion)	Quarter
January	65.8	2
February	75.3	4
March	80.5	6
April	90.2	4
May	42.3	7
June	53.3	8
July	33.9	5
August	27.5	3
September	65.2	6
October	73.3	8
November	89.9	9
December	92	3

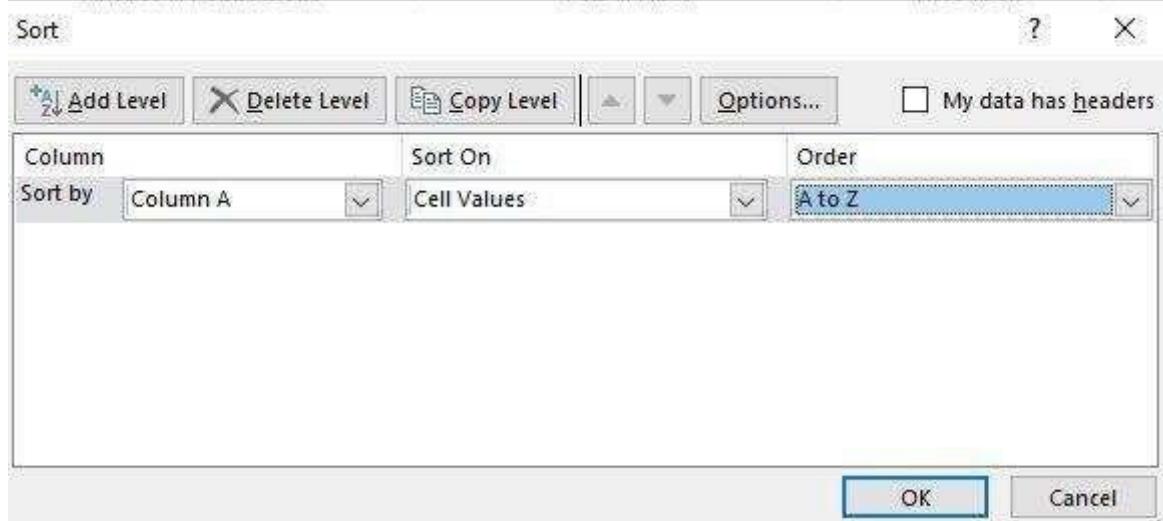
Sorting

Data analysis requires sorting the data. A list of names may be arranged alphabetically, a list of sales numbers can be ranged from highest to lowest, or rows can be sorted by colors or icons. Sorting data makes it easier to immediately view and comprehend your data, organize and locate the facts you need, and ultimately help you make better decisions. Both columns and rows can be used to sort. You'll utilize column sorts for the majority of your sorting. By text, numbers, dates, and times, a custom list, format, including cell color, font color, or icon set, you may sort data in one or more columns.

Step 1: Select any column from the table. Here we are going to select the **Months** column. After that go to the **data tab** on the top of the ribbon and the ninth **sort and filters group** select **sort**.

	A	B	C	D	E	F
1	Months	Sales (in billion)	Quarter			
2	January	65.8	2			
3	February	75.3	4			
4	March	80.5	6			
5	April	90.2	4			
6	May	42.3	7			
7	June	53.3	8			
8	July	33.9	5			
9	August	27.5	3			
10	September	65.2	6			
11	October	73.3	8			
12	November	89.9	9			
13	December	92	3			
14						

Step 2: Then a sort dialog box appears. Here first select the column, then select sort on, and then Order. After that click OK.



Step 3: Now as you can see the **months** column is now arranged alphabetically.

	A	B	C	D
1	Months	Sales(in billion)	Quarter	
2	April	65.8		2
3	August	75.3		4
4	December	80.5		6
5	February	90.2		4
6	January	42.3		7
7	July	53.3		8
8	June	33.9		5
9	March	27.5		3
10	May	65.2		6
11	November	73.3		8
12	October	89.9		9
13	September	92		3
14				
15				

Filter

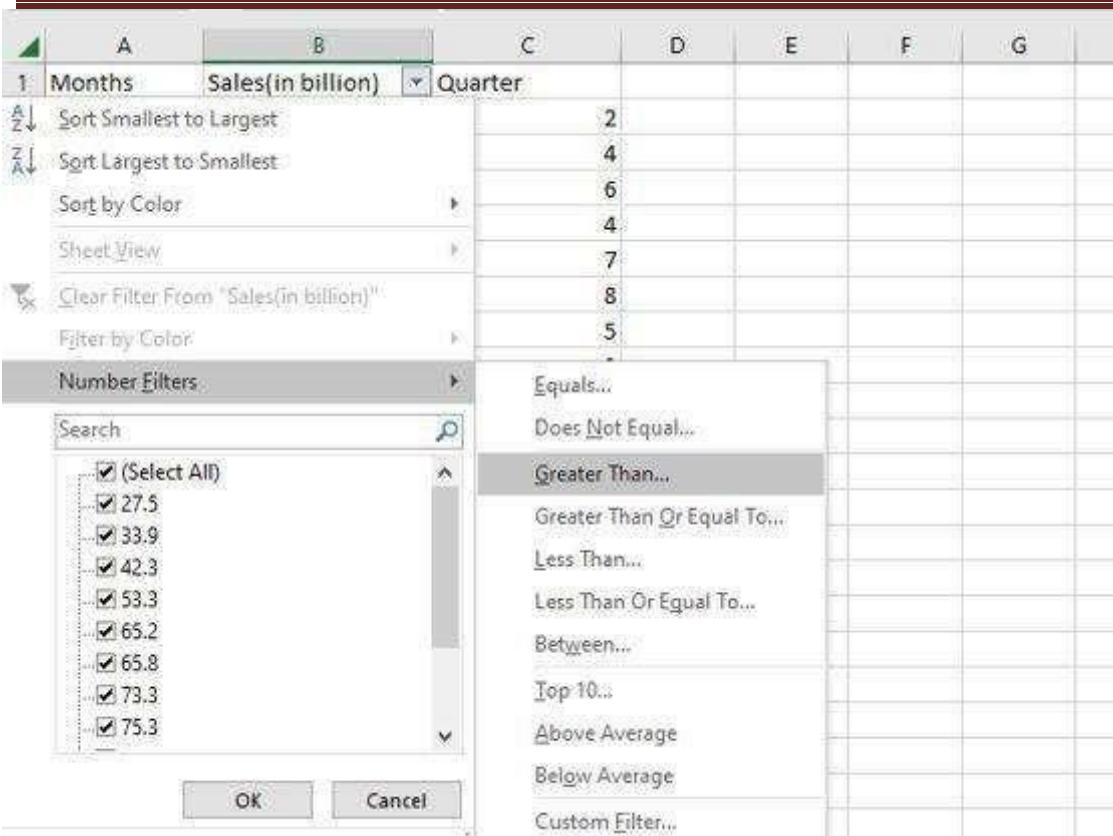
You may use filtering to pull in information from a given range or table that satisfies the specified criteria. This is a fast method of just showing the data you require. Data in a range, table, or PivotTable may be filtered. You may use Selected Values to filter data. You may adjust your filtering options in the Custom AutoFilter dialogue box that displays when you click a Filter option or the Custom Filter link that is located at the end of the list of filter options.

Step1: Select any column from the table. Here we are going to select **Sales column**. After that go to the **data tab** at the top of the ribbon and then in the **sort and filters group** select **filter**.

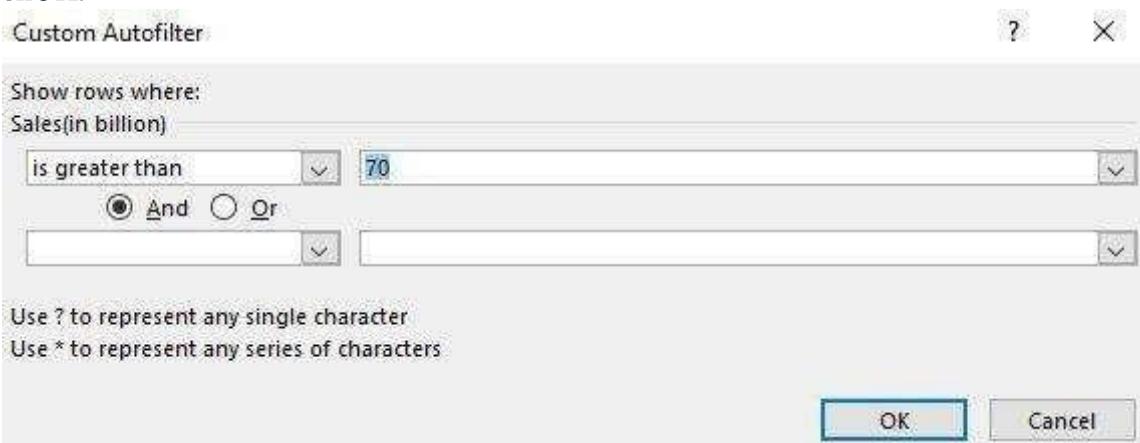
	A	B	C	D	E	F	G
1	Months	Sales(in billion)	Quarter				
2	January	65.8		2			
3	February	75.3		4			
4	March	80.5		6			
5	April	90.2		4			
6	May	42.3		7			
7	June	53.3		8			
8	July	33.9		5			
9	August	27.5		3			
10	September	65.2		6			
11	October	73.3		8			
12	November	89.9		9			
13	December	92		3			
14							

Step2: The values in the sales column are then shown in a drop-down box. Here we are going to select a number of filters and then greater than.

Data Analytics with Excel: BCS358A



Step 3: Then a custom autofilter dialog box appears. Here we are going to apply sales greater than 70 and then click OK.

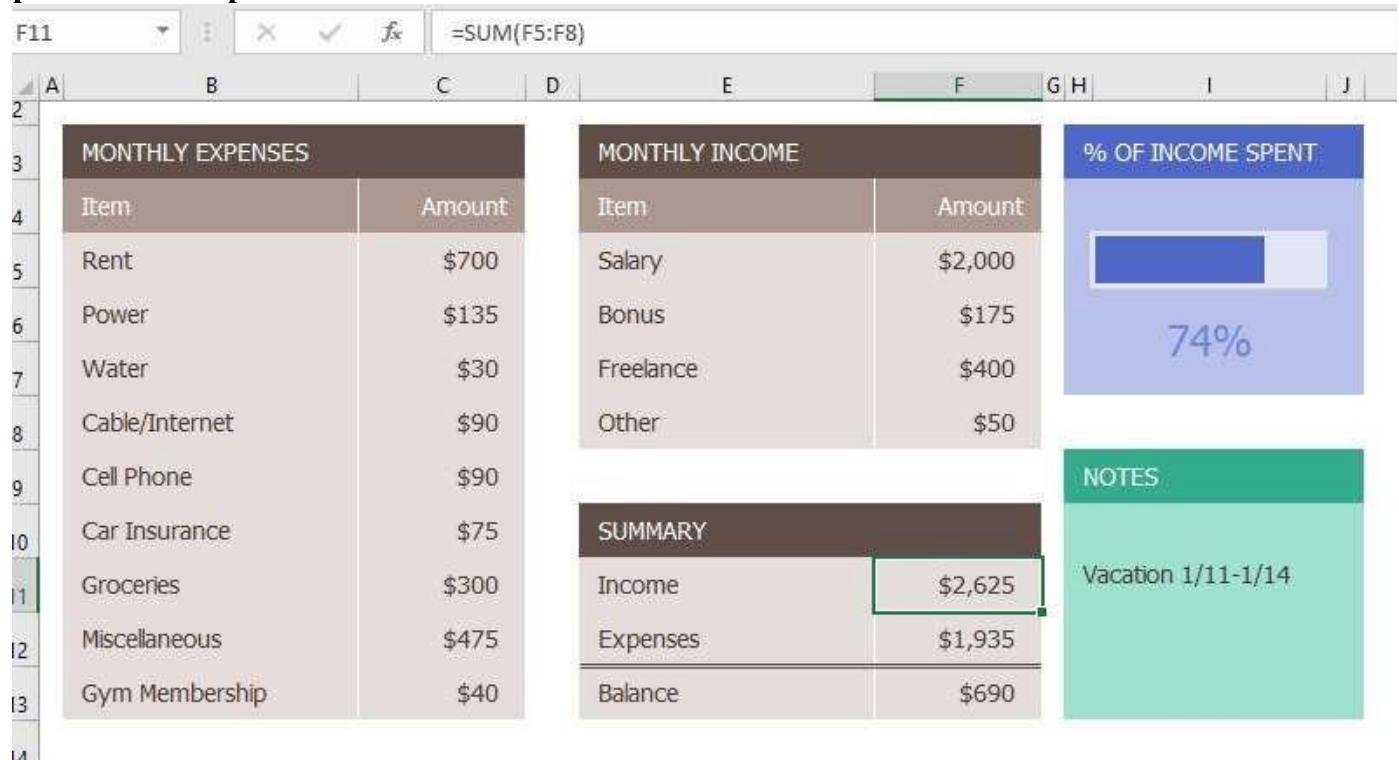


Step 4: Now as you can see only the rows greater than 70 are shown.

A	B	C	D
1	Months	Sales(in billion)	Quarter
3	February	75.3	4
4	March	80.5	6
5	April	90.2	4
11	October	73.3	8
12	November	89.9	9
13	December	92	3
14			
15			
16			

Experiment No:8

8.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.

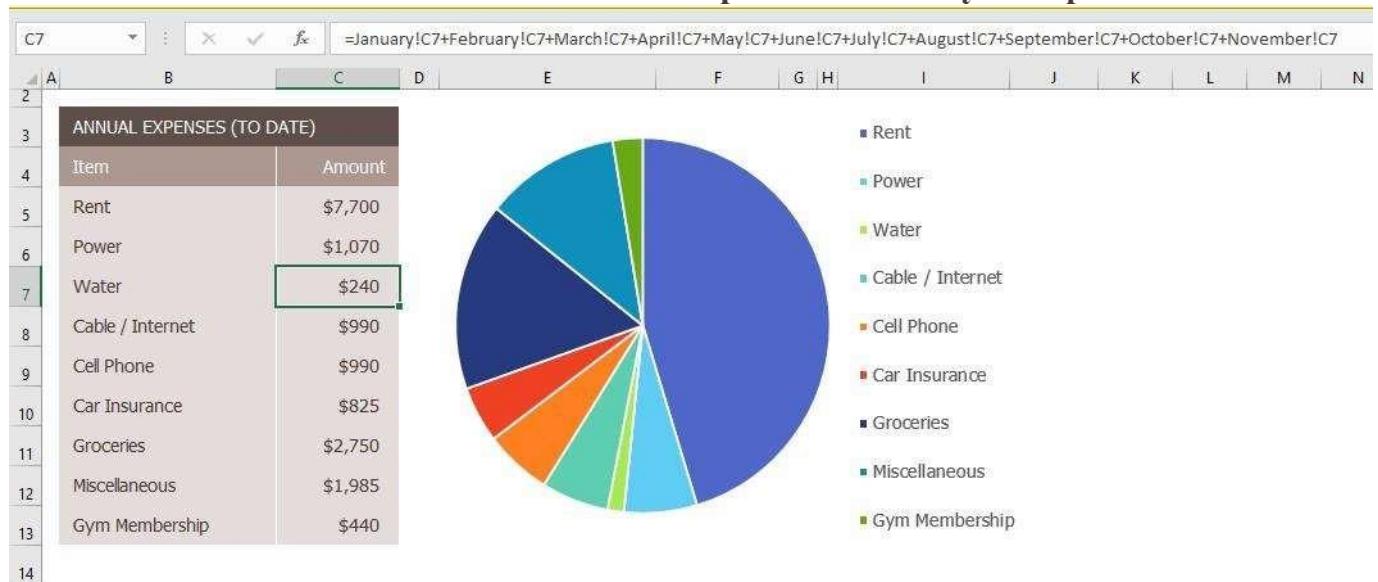


Expenses==SUM(C5:C13)

Balance==F11-F12

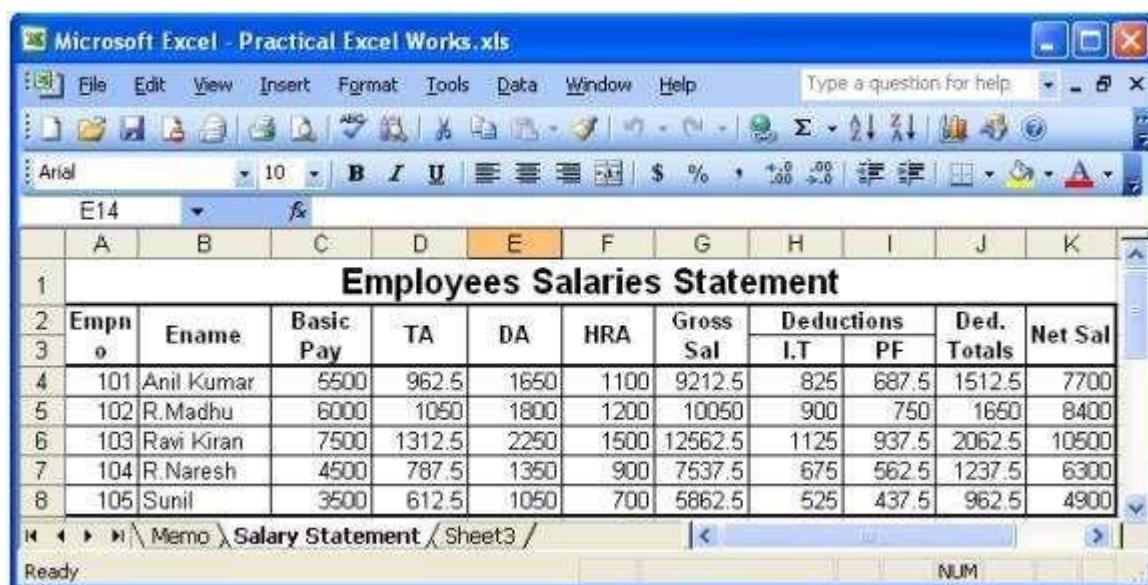
%Incomespent=F12/F11

Create a JAN to DEC worksheets then final report is Summary of expenses



9 Create worksheet with following fields: Empno, Ename, Basic Pay(BP), TravellingAllowance(TA), Dearness Allowance(DA), House Rent Allowance(HRA), IncomeTax(IT), ProvidentFund(PF),NetPay(NP).Useappropriateformulastocalculatetheabovescenario.Analyse the datausing appropriate chart and reportthe data.

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)
Given: DA = 30% of BP, HRA = 20% of BP, TA = 17.5% of BP, IT = 15% of BP, PF = 12.5% of BP



The screenshot shows a Microsoft Excel window titled "Microsoft Excel - Practical Excel Works.xls". The active sheet is "Sheet3" under the "Salary Statement" tab. The table is titled "Employees Salaries Statement" and has the following structure:

Empno	Ename	Basic Pay	TA	DA	HRA	Gross Sal	Deductions		Ded. Totals	Net Sal
							I.T	PF		
101	Anil Kumar	5500	962.5	1650	1100	9212.5	825	687.5	1512.5	7700
102	R.Madhu	6000	1050	1800	1200	10050	900	750	1650	8400
103	Ravi Kiran	7500	1312.5	2250	1500	12562.5	1125	937.5	2062.5	10500
104	R.Naresh	4500	787.5	1350	900	7537.5	675	562.5	1237.5	6300
105	Sunil	3500	612.5	1050	700	5862.5	525	437.5	962.5	4900

Steps:-

1. Create an Excel Worksheet for an employee payroll system.
2. Enter the details of Employee as given and calculate the DA, TA, HRA, IT, PF as a percentage on the basis of Basic Pay.
3. Calculate the Net Pay by using the formulae

$$\text{Gross Pay} = \text{DA} + \text{TA} + \text{HRA} + \text{BP}$$

$$\text{Deductions} = \text{IT} + \text{PF}$$

$$\text{Net Pay} = \text{Gross Pay} - \text{Deductions}$$

10 Create a 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.

What is an inventory sheet called?

What you call your inventory sheet is up to you, though keeping the name descriptive is a good idea. You may have an Inventory Sheet, Stock Inventory Control Sheet or Software Inventory Tracking Sheet. Always title actual inventories done with the date of the inventory conducted.

What are the main types of inventory?

There are four main types of

inventory that include raw materials, work in progress, finished goods and MRO (maintenance, repair and operations) inventory.

Is inventory an asset?

Yes, inventory is an asset because the company invests financial resources into buying or making the inventory. The inventory converts to revenue when items are sold. Because it has a financial property, it is considered an asset.

Do warehouse management systems manage inventory?

Warehouse management systems (WMS) are typically an add-on from your existing Enterprise Resource Planning (ERP) provider. ERP systems manage invoicing, accounting and inventory tracking. Learn more about warehouse management systems.

Inventory Control	Product Detail	Quantity Purchased	Price Unit	Quantity in Stock	Value Stock in	Reorder Level	Reorder Quantity	Quantity Sold	Discontinued Product
ABC001	Product 1	100	₹ 100.00	50	₹ 5,000.00	25	100	50	
ABC002	Product 2	50	₹ 200.00	25	₹ 5,000.00	50	50	25	
ABC003	Product 3	50	₹ 250.00	0	₹ 0.00	25	50	50	
ABC004	Product 4	50	₹ 500.00	0	₹ 0.00	50	50	50	
ABC005	Product 5	100	₹ 110.00	52	₹ 5,720.00	25	100	48	
ABC006	Product 6	100	₹ 120.00	75	₹ 9,000.00	50	100	25	
ABC007	Product 7	100	₹ 150.00	50	₹ 7,500.00	25	100	50	
ABC008	Product 8	50	₹ 135.00	0	₹ 0.00	50	50	50	
ABC009	Product 9	100	₹ 110.00	50	₹ 5,500.00	25	100	50	
ABC010	Product 10	100	₹ 100.00	65	₹ 6,500.00	50	100	35	
ABC011	Product 11	100	₹ 200.00	50	₹ 10,000.00	25	100	50	
ABC012	Product 12	100	₹ 110.00	50	₹ 5,500.00	50	100	50	
ABC013	Product 13	100	₹ 250.00	50	₹ 12,500.00	25	100	50	
ABC014	Product 14	50	₹ 350.00	0	₹ 0.00	50	50	50	
ABC015	Product 15	100	₹ 400.00	50	₹ 20,000.00	25	100	50	
ABC016	Product 16	100	₹ 150.00	50	₹ 7,500.00	25	100	50	
ABC017	Product 17	100	₹ 125.00	60	₹ 6,250.00	25	100	60	Yes
ABC018	Product 18	100	₹ 170.00	50	₹ 8,500.00	25	100	50	
ABC019	Product 19	100	₹ 125.00	50	₹ 6,250.00	50	100	50	
ABC020	Product 20	100	₹ 180.00	50	₹ 9,000.00	25	100	50	
ABC021	Product 21	100	₹ 230.00	50	₹ 11,500.00	50	100	50	
ABC022	Product 22	100	₹ 220.00	50	₹ 11,000.00	25	100	50	
ABC023	Product 23	100	₹ 100.00	2	₹ 200.00	50	100	88	Yes
ABC024	Product 24	100	₹ 250.00	50	₹ 12,500.00	25	100	50	
ABC025	Product 25	50	₹ 110.00	0	₹ 0.00	25	50	50	

11 Create worksheet on Sales analysis of Merchandise Store: data consisting of OrderID, 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.

Prepare the sales table region-wise in the working sheet.

Code Used :

Sales = $\text{OFFSET}(\text{AK42}, \text{ROW}() - 42, \text{F140})$ and later linked with combo box

Regions	Sum of Sales
Africa	713074
Canada	60003
Caribbean	260495
Central	1735900
Central Asia	321005
East	446468
EMEA	788072
North	750482
North Asia	369816
Oceania	544827
South	1034884
Southeast Asia	500923
West	497432
Grand Total	8023381

Regionwise Sale	
Regions	Regionwise Sales
Africa	123087
Canada	11413
Caribbean	47569
Central	278301
Central Asia	55886
East	68939
EMEA	131180
North	120926
North Asia	61194
Oceania	100477
South	175766
Southeast Asia	67711
West	76958

- Create a User Control Combo box for Product Category.

List of Product Categories
Auto & Accessories
Electronic
Fashion
Home & Furniture

Electronic
Auto & Accessor
Electronic
Fashion
Home & Furnitur

Code Used :

Electronic Box Shown above values gets populated accordingly as 1,2,3,4 respectively from various categories as shown above = $\text{OFFSET}(\text{L33}, \text{F140}, 0)$

- Create Column Chart of a month-wise table and region-wise table

Steps Followed :

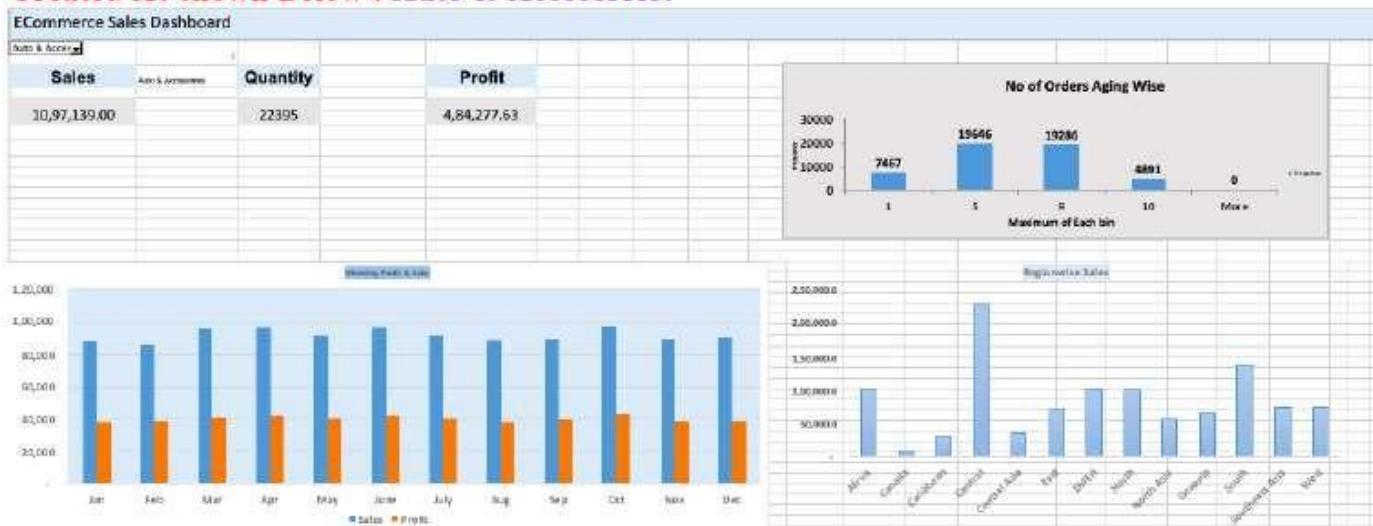
Select the column pertaining to month wise sales and profit and region wise sales and then click on Insert -> Data -> Chart and click on clustered 2D Chart to get output as below.

Right click on chart and format



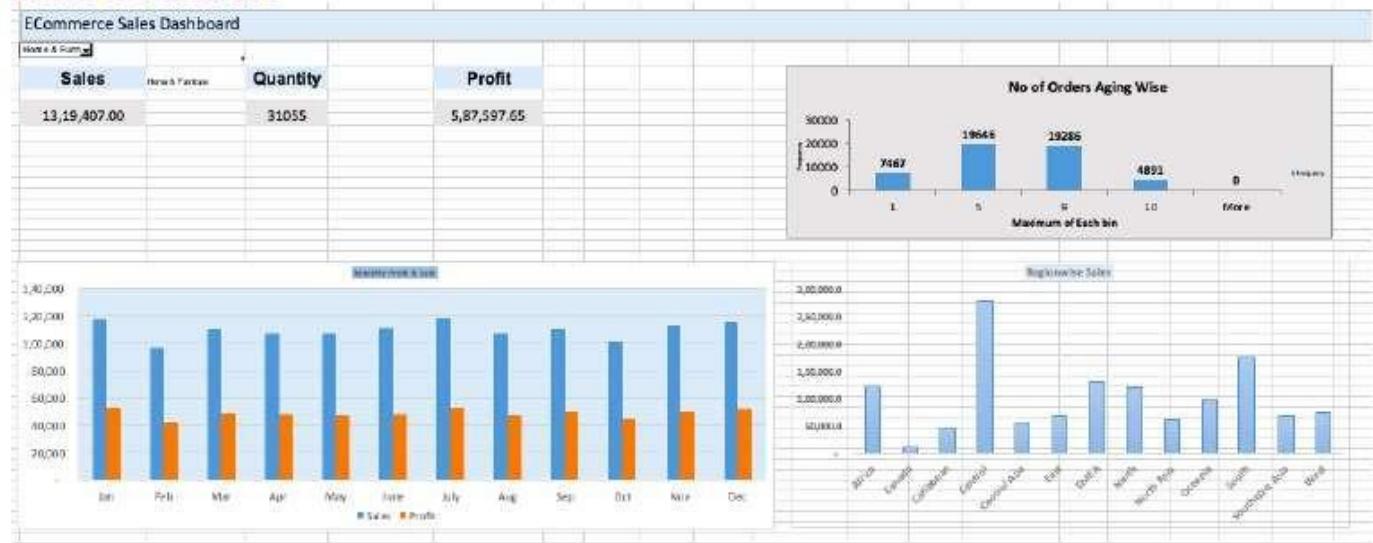
Business Analytics With Excel E-Commerce Sales Dashboard

Created As shown Below : Auto & Accessories



DataAnalyticswithExcel:BCS358A

Home & Furniture

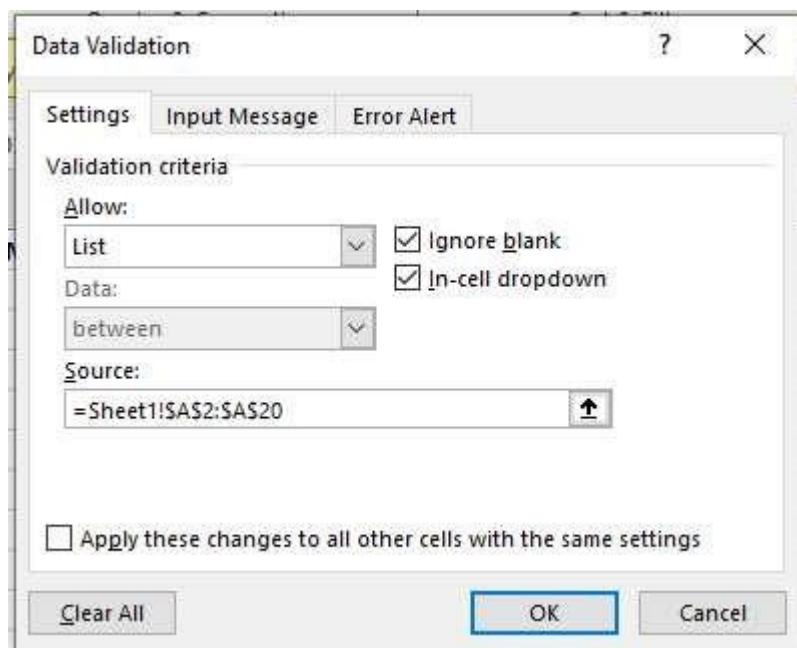


Experiment No:12

12 Generation of report & presentation using auto filter & macro.

DOB	MOBILE	GENDER	CASTE	Maths	DDCO	Operatin	DSA	DSA Lab	JAVA	Excel	SCR
31-May-06	8088973025	M	Category 2A	35	45	35	45	56	80	88	67
12-Jun-06	7892805685	M	Category 1	33	46	36	55	70	81	81	68
16-Mar-06	9148899438	M	General	44	47	37	56	71	82	82	69
16-Aug-05	7795055062	M	General	45	48	38	57	72	83	83	70
30-Jan-07	9742708608	F	Category 2B	49.5	49	39	58	73	84	84	71
02-Aug-06	8549014723	M	General	53.6	50	40	59	74	85	85	72
17-Apr-06	9742132199	M	General	57.7	51	41	60	75	86	86	73
13-Feb-06	9980304217	M	General	61.8	52	42	61	76	87	87	74
07-Aug-06	9739527541	F	Category 2A	65.9	53	43	62	77	88	88	75
15-Sep-06	9902551491	F	Category 3A	70	54	44	63	78	89	89	76
15-Apr-06	9845589384	F	Category 2B	74.1	55	45	64	79	90	90	77
05-Jun-06	9880680024	F	Category 3A	78.2	56	46	65	80	91	91	78
11-Aug-06	9380212811	M	Category 2A	82.3	57	47	66	81	92	92	79
30-Apr-05	9900426401	F	Category 2A	86.4	58	48	67	82	93	93	80
23-Mar-06	7483526739	M	SC	90.5	59	49	68	83	94	94	81
01-Nov-06	9902736715	M	SC	94.6	60	50	69	84	95	95	82
11-May-06	8970597734	F	Category 3A	98.7	61	51	70	85	96	96	83
29-Jun-06	9242874335	M	Category 3A	33	62	52	71	86	97	97	84
10-Apr-06	9900265877	M	General	20	63	53	72	87	98	98	85

Steps 1: Create a List for USN by selecting data from Previous



DataAnalyticswithExcel:BCS358A

Sheet

Go to DATA and data validation

For name, sem and father's Name do VLOOKUP

=VLOOKUP(\$E\$12,Sheet1!\$A\$2:\$Q\$21,3,0) and based on USN

For marks obtained use the formula

=VLOOKUP(\$E\$12,Sheet1!\$A\$2:\$Q\$20,MATCH(Sheet4!E19,Sheet1!\$A\$1:\$Q\$1,0),0)

 **K.S.INSTITUTE OF Technology**
Address

REPORT CARD

USN : 

SEM : III

NAME : ADVAITH ARYAG

FATHER : P GOPALA KRISHNA

MOTHER : MR SHILPA

Subject	Total	Min. Marks	Obtained Marks	Pass/Fail
Maths	100	35	35	PASSED
DDCO	100	35	45	PASSED
Operating System	100	35	35	PASSED
DSA	100	35	45	PASSED
DSA Lab	100	35	56	PASSED
JAVA	100	35	80	PASSED
Excel	100	35	88	PASSED
SCR	100	35	67	PASSED

Total Marks:	451
Percentage:	56.375
Pass/Fail:	