LAB MANUAL FOR DATA ANALYTICS USING EXCEL

1. Working with Format Cells Based on Data Type: Number, Accounting, Date, Time, and Text.

Aim:

Formatting cells based on data type

Formatting Access:

To format cells, you can:

1. Right-click on the cell(s) and select "Format cells."

2. Choose the desired category (Number, Accounting, Date, Time, or Text).

Formatting Steps:

1. Number:

- Using the Ribbon: In the dropdown list, select "Number."

- Adds comma separator and limits to 2 decimal places.

2. Accounting:

- Using the Ribbon: In the dropdown list, select "Accounting."

- Uses the Accounting style with the currency symbol (e.g., ₹).

3. Date:

- Using the Ribbon: In the dropdown list, select "Date."

- Chooses the style: dd/mm/yyyy.

4. Time:

- Using the Ribbon: In the dropdown list, select "Time."

- Chooses the style: 12 hours or 24 hours.

5. Text:

- Using the Ribbon: In the dropdown list, choose "Text."

DATA TYPE	INPUT VALUE	FINAL DISPLAY
NUMBER	1234.56	1,234.56
ACCOUNTING	5000	₹ 5,000.00
DATE	13-07-2025	13 July 2025
TIME	13:45	1.45.00 PM
TEXT	Data science	Data science

RESULT: This Data is Excuted Successfully

2. Design a Marks sheet using Font and Alignment on groups

AIM: Marks sheet using Font design and Alignment.

All columns -> A1, B1, C1, D1, E1, F1, G1

- Header row in Bold, in Ribbon selected Bold as Font family

- All columns -> Center Aligned, Home tab -> Alignment group -> click center and Middle Align

Entire Table -> Applying Borders, in Ribbon selecting Borders -> All Borders

Roll No -> centered and Bold -> Alignment -> center and Middle Align, selected B in Ribbon

Name -> Wrap text -> Ribbon -> Wrap text button

Subjects -> centre Alignment -> Ribbon selecting Borders -> All Borders.

ROLLNO	NAME	TAMIL	ENGLISH	MATH	SCIENCE	SOCIAL
1	MAX	90	85	99	65	77
2	STEVE	75	85	97	78	76
3	ELEVEN	65	62	80	81	71
4	ALICE	82	65	82	83	82

3) Calculation Functions = SUM, AVERAGE, MIN, MAX, COUNT.

AIM: Calculating SUM, AVERAGE, MIN, MAX, COUNT of Given Data

COUNT = Salary Year2 : Salary Year11

Formula: =COUNT(salaryyear2:salaryyear11)

=COUNT(C2:C11)

SUM = Salary Year2 : Salary Year11

Formula: =SUM(salaryyear2:salaryyear11)

=SUM(C2:C11)

AVERAGE = Salary Year2 : Salary Year11

Formula: =AVERAGE(salaryyear2:salaryyear11)

=AVERAGE(C2:C11)

MIN = Salary Year2 : Salary Year11

Formula: =MIN(salaryyear2:salaryyear11)

=MIN(C2:C11)

MAX = Salary Year2 : Salary Year11

Formula: =MAX(salaryyear2:salaryyear11)

=MAX(C2:C11)

Given Spreadsheet

job_title_short	job_country	salary_year_avg
Senior Data Scientist	Sudan	128050
Data Engineer	United States	140000
Senior Data Analyst	United States	156000
Machine Learning Engineer	United States	140000
Data Scientist	United States	224500
Data Engineer	Sudan	224500
Data Engineer	France	135000
Senior Data Engineer	Canada	120000
Senior Data Analyst	Germany	170000
Data Scientist	spain	224500
Data Scientist	Iran	163500

SOLUTION:

COUNT	11
SUM	1826050
AVERAGE	166004.5455
MIN	120000
MAX	224500

4) Text Functions - LEFT, RIGHT, MID, UPPER,LOWER,LEN.

AIM: using Text Function to display Text..

- D2 = LEFT(B2,3) - Returns the first three characters from the left.
- D3 = RIGHT(B2,3) - Returns three characters from the right side.
- D4 = MID(B2,1,4) - Returns the characters of the middle of the string.
- D6 = UPPER(B2) - Makes characters upper case.
- D6 = LOWER(B2) - Makes characters lower case.
- D7 = LEN(B2) - Returns the length of characters.

FUNCTION	TEXT DATA	FORMULA	RESULT
LEFT	Data Science	LEFT(B2,3)	Dat
RIGHT		RIGHT(B2,3)	nce
MID		MID(B2,1,4)	Data
UPPER		UPPER(B2)	DATA SCIENCE
LOWER		LOWER(B2)	data science
LEN		LEN(B2)	12

5)Summarize student information using pivot table

AIM: using pivot table.

a spreadsheet containing student grades for different assignments, like this:

STUDENT NAME	ASSIGNMENT	SCORE	LETTER GRADE
Alice	Project 1	95	A
Bob	Project 1	82	B
Charlie	Project 1	70	C
David	Project 1	90	A
Alice	Project 2	88	B
Bob	Project 2	92	A

Charlie	Project 2	75	C
David	Project 2	85	B
Alice	Quiz A	10	A
Bob	Quiz A	8	B
Charlie	Quiz A	6	C
David	Quiz A	9	A
Alice	Quiz B	9	A
Bob	Quiz B	7	C
Charlie	Quiz B	5	D
David	Quiz B	8	B

Creating a PivotTable for grade analysis

Prepare your Data: Ensure your data is organized in a tabular format with column headers.

Insert PivotTable: Select your data range, go to the "Insert" tab, and click "PivotTable."

Choose Destination: Select whether you want the PivotTable in a new or existing worksheet.

Build PivotTable:

Drag "Student Name" to the Rows area.

Drag "Assignment" to the Columns area.

Drag "Score" to the Values area.

By default, the "Score" will likely be set to "Sum." To calculate the average score, right-click on "Sum of Score" in the Values area, select "Value Field Settings," and choose "Average."

Average of SCORE	**Column Labels**				
Row Labels	**Project 1**	**Project 2**	**Quiz A**	**Quiz B**	**Grand Total**
Alice	95	88	10	9	50.5
Bob	82	92	8	7	47.25
Charlie	70	75	6	5	39
David	90	85	9	8	48
Grand Total	**84.25**	**85**	**8.25**	**7.25**	**46.1875**

Experiment No. 6

Title:

Consolidation of Four-Semester Student Marks and Semester-wise Ranking Using Excel

Aim:

To consolidate student marks across four semesters and calculate semester-wise percentages and ranks using formulas and sorting functions in Microsoft Excel.

Apparatus / Software Required:

- Microsoft Excel 2016 or later (Office 365 preferred)

Table:

1	A	B	C	D	E	F	G	H	I	J
2	**Student Name**	**Sem 1 Marks**	**Sem1 %**	**Sem1 Rank**	**Sem 2 Marks**	**Sem2 %**	**Sem2 Rank**	**Sem 3 Marks**	**Sem3 %**	**Sem3 Rank**
3	John	450	90	A	470	94	A	430	86	B
4	Mary	370	74	C	480	96	A	440	88	B
5	David	430	86	B	450	90	A	460	92	A

6	K	L	M	N	O	P
7	**Sem4 Marks**	**Sem4 %**	**Sem4 Rank**	**Total Marks**	**Total %**	**Overall Rank**
8	460	92	A	1810	90.5	A
9	470	94	A	1760	88	B
10	455	91	A	1795	89.75	B

Procedure:

Step	Formula / Action
Sem1 Marks	Enter manually (e.g. 450)
Sem1 % Formula	=(B2/500)*100
Sem1 Rank Formula	=IFS(C2>=90, "A", C2>=80, "B", C2>=70, "C", C2<70, "F")
Sem2 Marks	Enter manually (e.g. 460)
Sem2 % Formula	=(E2/500)*100
Sem2 Rank Formula	=IFS(F2>=90, "A", F2>=80, "B", F2>=70, "C", F2<70, "F")
Sem3 Marks	Enter manually (e.g. 470)
Sem3 % Formula	=(H2/500)*100
Sem3 Rank Formula	=IFS(I2>=90, "A", I2>=80, "B", I2>=70, "C", I2<70, "F")
Sem4 Marks	Enter manually (e.g. 480)
Sem4 % Formula	=(K2/500)*100
Sem4 Rank Formula	=IFS(L2>=90, "A", L2>=80, "B", L2>=70, "C", L2<70, "F")
Total Marks Formula	=SUM(K2,H2,E2,B2)
Total % Formula	=(N2/2000)*100
Overall Rank Formula	**=IFS(O2>=90, "A", O2>=80, "B", O2>=70, "C", O2<70, "F")**

Result:

Successfully consolidated student marks across four semesters, calculated semester-wise percentages, and assigned semester-wise as well as overall ranks using Microsoft Excel.

Experiment No. 7:

Title:

Program to Create Employee Salary Sheet Using Excel

Aim:

To prepare a structured salary sheet for employees that calculates Gross Salary, Deductions, and Net Pay using formulas in Microsoft Excel.

Apparatus / Software Required:

Microsoft Excel 2016 or later

Table:

	A	B	C	D	E	F	G
1	**Employee Name**	**Basic Pay**	**HRA**	**Allowances**	**Gross Salary Formula**	**Deductions Formula**	**Net Pay Formula**
2	John	$25,000.00	$5,000.00	$2,000.00	32000	4800	27200
3	Mary	$30,000.00	$6,000.00	$4,000.00	40000	6000	34000
4	David	$45,000.00	$7,000.00	$5,000.00	57000	11400	45600

PROCEDURE – EXPERIMENT 7: Employee Salary Sheet

1. **Gross Salary Formula**

   =SUM(B3:D3)

2. **Deductions Formula**

   =IF(E3>50000, E3*20%, E3*15%)

3. **Net Pay Formula**

   =E3 – F3

Result:

Successfully created a professional employee salary sheet calculating Gross Pay, Deductions, and Net Pay dynamically using Excel formulas.

Experiment No. 8

Title:

Programme to Filter Out Information Using Microsoft Excel

Aim:

To extract and display specific records from a large dataset based on a specified condition using filtering tools or formulas in Microsoft Excel.

Apparatus / Software Required:

Microsoft Excel 2016 or later (Office 365 preferred for dynamic functions)

TABLE:

	A	B	C	D
1	**Student Name**	**Subject**	**Marks**	**Grade**
2	John	Maths	85	A
3	Mary	Science	65	B
4	David	Maths	90	A
5	Rahul	Science	45	C
6	Priya	English	75	B

PROCEDURE – EXPERIMENT 8: Filter Information Using Excel

1. ### Enter the Dataset

   In Excel, create the following table:

	A	B	C	D
1	**Student Name**	**Subject**	**Marks**	**Grade**
2	John	Maths	85	A
3	Mary	Science	65	B
4	David	Maths	90	A
5	Rahul	Science	45	C
6	Priya	English	75	B

Manual Filter Method

- Go to the **Data** tab.
- Click **Filter** (on the toolbar).
- Dropdown arrows appear in headers.
- Click the dropdown in the **Grade** column.
- Select **A** and click **OK**.
- Only students with **Grade A** will be displayed.

Dynamic Filter Formula Method (Excel 365 Recommended)

- In an empty cell, type the following formula:
  =FILTER(A2:D6, D2:D6="A", "No Records Found")
  *This formula will display only the records where **Grade = A**

Filtered Output Table (Example):

	A	B	C	D
1	**Student Name**	**Subject**	**Marks**	**Grade**
2	John	Maths	85	A
3	David	Maths	90	A

Experiment No. 9

Title:

Programme to Extract Specific Information from Composite Data Using Excel

Aim:

To extract substrings from a composite text field into separate columns using string functions in Microsoft Excel.

Apparatus / Software Required:

- Microsoft Excel 2016 or later (Office 365 recommended)

TABLE:

	A	B	C	D
1	**Composite Code**	**Country Code Formula**	**Region Formula**	**Serial Number Formula**
2	US-CA-12345	US	CA	12345
3	IN-TN-56660	IN	TN	56660
4	UK-LN-54321	UK	LN	54321

PROCEDURE – EXPERIMENT 9: Extract Specific Information Using Excel

1. **Enter the Data**
   In **Column A**, list composite codes such as:

Composite Code
US-CA-12345
IN-TN-67890
UK-LN-54321

2. **Extract Country Code**

- Use the **LEFT()** function to extract the first two characters (Country Code).
- Formula:

  =LEFT(A2, 2)

3. **Extract Region Code**

- Use the **MID()** function to extract two characters starting from position 4 (Region Code).
- Formula:

  =MID(A2, 4, 2)

4. **Extract Serial Number**

- Use the **RIGHT()** function to extract the last five characters (Serial Number).
- Formula:

  =RIGHT(A2, 5)

5. **Drag Formulas Down**

- Drag the formulas down to apply for all rows.

6. **Result**
   Composite codes will be split into **Country Code**, **Region Code**, and **Serial Number**, displayed in adjacent columns.

Experiment No. 10

Title:

Import External Data from Text/CSV Files into Excel

Aim:

To import and organise data from external .txt or .csv files into Excel for further analysis.

Apparatus / Software Required:

- Microsoft Excel 2016 or later (Power Query preferred)

TABLE:

Imported Student Data from CSV/TXT File

	A	B	C
1	**Name**	**Subject**	**Marks**
2	John	Maths	85
3	Mary	Science	75
4	David	English	90

Source File Format (CSV):

The data should be in a .csv file (e.g. student_data.csv) with the following content:

Name,Subject,Marks
John,Maths,85
Mary,Science,75
David,English,90

PROCEDURE – EXPERIMENT 10: Importing External Data into Excel

A. Importing CSV File into Excel

1. Open **Microsoft Excel**.
2. Go to the **Data** tab on the ribbon.
3. Click **Get Data → From File → From Text/CSV**.
4. Browse and select your CSV file (e.g. student_data.csv).
5. In the import window, preview the data.
6. Click **Load** to import data directly as a table into your Excel sheet.
7. The CSV file data will appear as a structured table in Excel:

	A	B	C
1	**Name**	**Subject**	**Marks**
2	John	Maths	85
3	Mary	Science	75
4	David	English	90

B. Importing TXT File and Formatting as Table

1. Open **Microsoft Excel**.
2. Go to the **Data** tab → click **Get Data → From File → From Text/CSV**.
3. Browse and select the .txt file (e.g. student_data.txt).
4. In the import wizard, select **Delimiter**:
    a. If the file uses commas → select **Comma Delimiter**.
    b. If the file uses tabs → select **Tab Delimiter**.
5. Preview the data correctly separated into columns.
6. Click **Load** to import.
7. Once imported:
    a. Select the data.
    b. Click **Insert** tab → choose **Table** Ensure **"My table has headers"** is checked.
8. The TXT file data will now appear in a clean, structured table format.

Experiment No. 11

Title:

Predicting Future Values Using Scenario Manager in Microsoft Excel

Aim:

To analyze and forecast future outcomes by creating different scenarios for variable data inputs using Excel's Scenario Manager.

Software Required:

- Microsoft Excel (2016 or later recommended)

TABLE:

price	units sold	cost per unit	profit
90	200	50	8000

Scenario Summary:

Scenario Summary				
	Current Values:	optimistic	pessimistic	basecase
Changing Cells:				
$A$2	90	30	90	50
$B$2	200	50	200	100
$C$2	50	10	50	30
Result Cells:				
$D$2	8000	1000	8000	2000

Procedure:

1. **Set Up Your Spreadsheet:**

   Enter the following data:

   ```
   A1: Price
   B1: Units Sold
   C1: Cost per Unit
   D1: Profit
   ```

   In **D2**, enter the profit formula:

   ```
   =(A2 - C2) * B2
   ```

This calculates profit based on price, cost per unit, and units sold.

2. **Go to Scenario Manager:**
   a. Click the **Data** tab.
   b. Select **What-If Analysis**.
   c. Choose **Scenario Manager**.
3. **Add Scenarios:**
   a. Click **Add** to create each scenario.

Scenario: Optimistic

Name: Optimistic
Changing Cells: A2, B2, C2
Values:

1. A2 (Price): 90
2. B2 (Units Sold): 200
3. C2 (Cost per Unit): 50

Scenario: Pessimistic

ii. Name: Pessimistic
iii. Changing Cells: A2, B2, C2
iv. Values:
    1. A2: 30
    2. B2: 50
    3. C2: 10

Scenario: Base case

v. Name: Base case
vi. Changing Cells: A2, B2, C2
vii. Values:
    1. A2: 90
    2. B2: 200
    3. C2: 50

4. **Generate Scenario Summary:**
    a. After adding all scenarios, click **Summary**.
    b. Select **Result cell D2** (Profit).
    c. Excel will generate a new sheet showing all scenarios with their changing values and resulting profit.

Experiment No. 12

Title:

Recording a Macro to Assign Custom Shortcut Keys in Microsoft Excel

Aim:

To automate tasks and improve efficiency by recording macros and assigning them to custom shortcut keys in Excel.

Software Required:

- Microsoft Excel (preferably a version with macro support, like Excel 2016 or newer)

TABLE:

Student Name	Subject	Marks
Asha	Science	88
Rohan	Math	76
Priya	English	91
Karthik	History	69
Sneha	Math	84
Arjun	Science	73
Divya	English	95

PROCEDURES:

Navigate to the View Tab

- Click the **View** tab → click the **Macros** dropdown
- Select **Record Macro**

Fill Out Macro Details

In the popup:

- Give your macro a **name** (e.g., `FilterHighmarks`)
- Assign a **shortcut key** (e.g., Ctrl + Shift + F)
- Store it in **This Workbook**
- Add a description, e.g., *"Filters marks above 80"*
- Click **OK** to begin recording

Apply the Filter

- Select your dataset (e.g., A1:C8)
- Go to the **Data** tab → click **Filter**
- Click the dropdown in the **Marks** column
- Choose **Number Filters** → **Greater Than**
- Type **80** → Click **OK**

Stop Recording

- Return to the **View** tab → click **Macros** → choose **Stop Recording**

Result:

The macro was recorded successfully and assigned a shortcut key. Pressing the shortcut instantly filtered the dataset to show students with marks above 80.

Experiment No. 13

Title:

Designing a Bar Chart for Student Marks Using Microsoft Excel

Aim:

To create a visual representation of student marks using a bar chart in Microsoft Excel to simplify data analysis and interpretation.

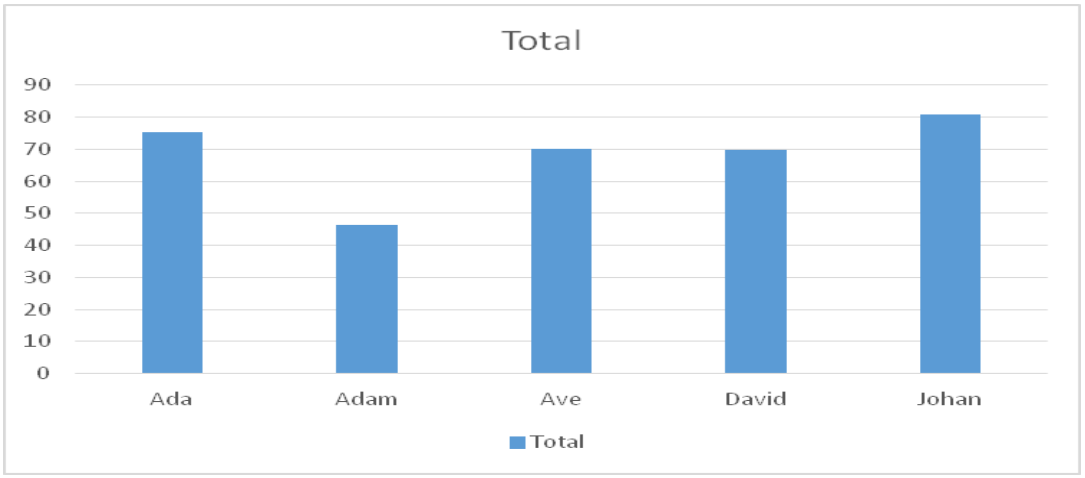
Software Required:

- Microsoft Excel (any version that supports chart tools)

TABLE:

Roll no	*name*	*english*	*math*	*science*	*social*	*total*	*Average*	*Grade*	*Rank*
1	Johan	90	70	65	98	323	80.75	Distinction	1
2	Ave	69	72	70	70	281	70.25	Distinction	3
3	Adam	50	40	45	50	185	46.25	Fail	5
4	David	70	70	60	79	279	69.75	FALSE	4
5	Ada	78	69	67	87	301	75.25	Distinction	2

CHART:



Procedure:

Data Entry

- Open Microsoft Excel.
- Enter the student data in this format:

```
| Roll no | Name  | English | Math | Science | Social |
```

- Fill in marks for each subject (C2 to F2 for first student, and so on).

Calculate Total

- In cell `G2`, type:

```
=SUM(C2:F2)
```

- Drag the formula down for all students.

Calculate Average

- In cell `H2`, type:

```
=AVERAGE(C2:F2)
```

- Drag the formula down for the rest.

Assign Grade

- In cell `I2`, type:

```
=IF(H2>=70,"Distinction",IF(H2>60,"First
Class",IF(H2<=50,"Fail","Second Class")))
```

Note: You may adjust logic to reflect your grading scheme.

Drag down to apply to all rows.

Assign Rank

- In cell `J2`, type:

```
=RANK(H2,$H$2:$H$6,0)
```

- Drag the formula down to assign ranks based on average marks.

Chart Creation: Bar Chart of Student Marks

Steps:

1. Select the range containing student names and subject marks:

   ```
   B1:B6, G1:G6
   ```

2. Go to **Insert → Charts** group → Select **Bar Chart** → Choose **Clustered Bar**.
3. The chart will show bars for each subject across students.
4. Customize chart:
   a. Add Chart Title: *"Subject-wise Marks of Students"*
   b. Add axes titles:
      i. Horizontal: *"Subjects"*
      ii. Vertical: *"Marks"*

Result:

A visually informative bar chart that displays individual student performance across subjects and computed statistics such as total, average, grade, and rank.

EXPERIMENT 14:

TITLE:

FORMAT CHART USING FORMAT PLOT AREA, FORMAT DATA SERIES AND ADD TREND LINE

Aim:

To create a professional chart in Microsoft Excel by formatting the plot area and data series, and adding a trendline to analyze and predict sales performance.

Software Required:

- Microsoft Excel (2013 or newer)

TABLE:

	A	B
1	**Month**	**Sales (₹)**
2	Jan	20,000
3	Feb	25,000
4	Mar	30,000
5	Apr	35,000
6	May	40,000

Procedure:

1. **Create the Data Table** Enter the sample data in an Excel worksheet.
2. **Insert a Chart**
    a. Select the table.
    b. Go to `Insert > Chart > Line Chart`
3. **Format Plot Area**
    a. Click on chart background.
    b. Right-click > Format Plot Area.

    c. Choose background fill (solid color).
4. **Format Data Series**

a. Click on the data line
b. Right-click > Format
c. Adjust line color, thickness, and marker shape.
d. Apply smoothing or transparency if desired.

5. **Add a Trendline**
    a. On The Format Section in Chart sheet at Right Side>Under Series > Add Trendline.
    b. Select “Linear”.

Trendline Formula Example:

Excel will display a formula like:

```
y = 5000x + 15000
```

Where:

- x = month index (Jan = 1, Feb = 2, ...)
- y = predicted sales

For June (x = 6):

```
y = 5000 × 6 + 15000 = ₹45,000
```

Result

The chart was successfully created using Microsoft Excel, displaying monthly sales data with visual enhancements through plot area and data series formatting. A linear trendline was added to the chart, showing a clear upward pattern in sales over time.