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RNS INSTITUTE OF TECHNOLOGY

Autonomous Institution Affiliated to VTU, Recognized by GOK, Approved by AICTE, New Delhi
(NAAC 'A+ Grade' Accredited, NBA Accredited (UG - CSE, ECE, ISE, EIE and EEE)
Channasandra, Dr. Vishnuvardhan Road, Bengaluru - 560 098
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DEPARTMENT OF CSE (Data Science)

DATA ANALYSIS WITH EXCEL LAB MANUAL

(BCS358A)

(As per Visvesvaraya Technological University Course type- PCCL)

Compiled by

DEPARTMENT OF CSE (Data Science)
R N S Institute of Technology
Bengaluru-98

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DEPARTMENT OF CSE (Data Science)

Vision of the Department

Empowering students to solve complex real-time computing problems involving high volume multi-dimensional data.

Mission of the Department

- **Provide quality education in both theoretical and applied Computer Science to solve real world problems.**
- **Conduct research to develop algorithms that solve complex problems involving multi-dimensional high-volume data through intelligent inferencing.**
- **Develop good linkages with industry and research organizations to expose students to global problems and find optimal solutions.**
- **Creating confident Graduates who can contribute to the nation through high levels of commitment following ethical practices and with integrity.**

Disclaimer

Trademark

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Document Owner

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COURSE OUTCOMES

Course Outcomes: At the end of this course, students are able to:
CO1- Use advanced functions and productivity tools to assist in developing worksheets
CO2- Manipulate data lists using Outline and PivotTables
CO3- Use Consolidation to summaries and report results from multiple worksheets
CO4- Apply Macros and Autofilter to solve the given real-world scenario

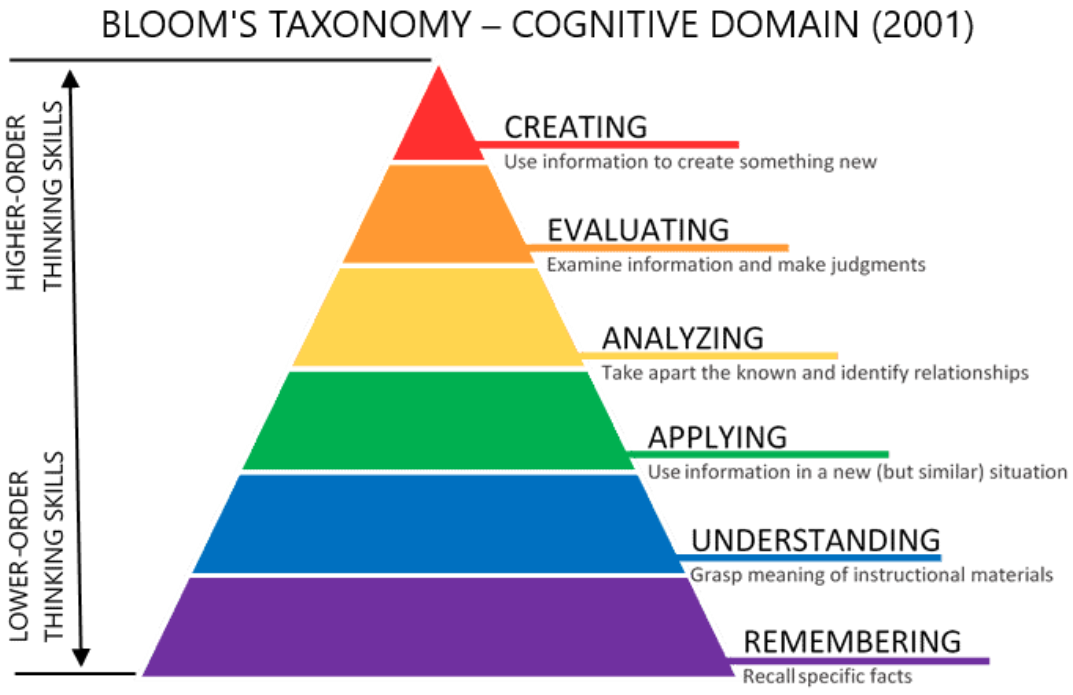
COs and POs Mapping of lab Component

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	3	2	2	2	3			3				
CO2	3	3	3	3	3	2	2	2	3			3				
CO3	3	3	3	3	3	2	2	2	3			3				
CO4	3	3	3	3	3	2	2	2	3			3				

Mapping of 'Graduate Attributes' (GAs) and 'Program Outcomes' (POs)

Graduate Attributes (GAs) (As per Washington Accord Accreditation)	Program Outcomes (POs) (As per NBA New Delhi)
Engineering Knowledge	Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems
Problem Analysis	Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
Design/Development of solutions	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate considerations for the public health and safety and the cultural, societal and environmental consideration.
Conduct Investigation of complex problems	Use research – based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
Modern Tool Usage	Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
The engineer and society	Apply reasoning informed by the contextual knowledge to assess society, health, safety, legal and cultural issues and the consequential responsibilities relevant to the professional engineering practice.
Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental context and demonstrate the knowledge of and need for sustainable development.
Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
Individual and team work	Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
Project management & finance	Demonstrate knowledge and understanding of the engineering and management principles and apply these to ones won work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
Life Long Learning	Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

REVISED BLOOMS TAXONOMY (RBT)



PROBLEM LIST

Sl. NO.	***Problem Description***	***Page No.***
1	Creation of spreadsheets, insertion of rows and columns drag and 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.	
11	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.	
12	Generation of report & presentation using Autofilter &macro.	

Question 1:

Creation of spreadsheets, insertion of rows and columns drag and fill, use of aggregate functions

Part A

1: Create a Simple Sequence

1. In an empty cell (let's say, A1), type the number 1.
2. Click on the small square at the bottom-right corner of cell A1 (the fill handle).
3. While holding down the left mouse button, drag the fill handle to the right or down to fill the adjacent cells with a sequence of numbers.

2: Create a Linear Series using fill handle

1. In an empty cell (e.g., B1), type "2" to start a series.
2. In the next cell (B2), type "4" to define the step increment.
3. Click and drag the fill handle from cell B2 to extend the linear series in adjacent cells. The fill handle should recognize the pattern and continue the series.

3: Fill Dates

1. In cell C1, enter a date (e.g., "01/01/2023").
2. Use the fill handle to drag down or to the right to create a series of dates. The application should recognize that you want a date series and increment the dates accordingly.

4: Generate Formulas

1. In cell D1, enter a simple formula like "=A1*2". This formula doubles the value in cell A1.
2. Use the fill handle to drag and fill adjacent cells. The formula should adjust automatically to reference the appropriate cells.

5. Demonstrate the Aggregate functions

Enter Sample Data: In Column A (from A2 to A11), enter the following numbers:

12, 15, 18, 21, 24, 27, 30, 33, 36, 39.

Basic Aggregate Functions:

In an empty cell, let's say B1, use basic aggregate functions:

=SUM(A2:A11) to calculate the sum of the numbers.

=AVERAGE(A2:A11) to calculate the average of the numbers.

=MIN(A2:A11) to find the minimum value in the range.

=MAX(A2:A11) to find the maximum value in the range.

6. Demonstrate Flash fill and Auto Fill

Auto Fill:

1. Enter Data: In Column A (from A2 to A6), enter the following numbers: 1, 2, 3, 4, 5.

2. Using Auto Fill: In cell B2, type the starting date (e.g., "01-Jan-2023") .Hover over the bottom-right corner of cell B2 until you see a small square (the fill handle).Click and drag down to fill the cells with a series of dates. Excel will automatically recognize the pattern and continue the series.

Flash Fill:

1. Enter Data: In Column A (from A2 to A6), enter full names (e.g., "Minaakshi sundara", "Tarini Kanork").

2. Using Flash Fill: In Column B (starting from B2), manually type the first name for the first entry (e.g., "John"). In Column C (starting from C2), manually type the last name for the first entry (e.g., "Doe"). In Column B2, press `Ctrl + E` (or go to Data > Flash Fill). Excel will automatically fill in the rest of the first names.In Column C2, do the same (press `Ctrl + E` or go to Data > Flash Fill), and Excel will automatically fill in the last names.

Part B

Create a spreadsheet to record information for 20 students, including their scores in 4 different subjects.

Columns:

- Column A: Student Names (A2 to A21)
- Column B: Subject 1 Scores (B2 to B21)
- Column C: Subject 2 Scores (C2 to C21)
- Column D: Subject 3 Scores (D2 to D21)
- Column E: Subject 4 Scores (E2 to E21)

Task:

Input the names of the students and their corresponding scores for each of the four subjects. Subsequently, calculate the total score for each student and determine their percentage.

Solution :

1. Enter Data:
   - Student names in Column A (from A2 to A21).
   - Scores for Subject 1 in Column B (from B2 to B21).
   - Scores for Subject 2 in Column C (from C2 to C21).
   - Scores for Subject 3 in Column D (from D2 to D21).
   - Scores for Subject 4 in Column E (from E2 to E21).

2. Calculate Total Score Using Absolute References:

- In Column F (starting from F2), use the formula `=B2+C2+D2+E2` to calculate the total score for the first student.

- Drag this formula down for all 20 rows to calculate the total scores for all students.

3. Calculate Percentage Using Relative and Absolute References:

- In Column G (starting from G2), use the formula `=SUM()` to calculate the total for the first student and drag to form relative sum. Use absolute reference by fixing row and column prefixing $ for row and column ex: ($B2: $E2). Drag this formula down for all 20 rows to calculate the percentages for all students.

4. Format Percentage:

- Format the cells in Column G as percentages with two decimal places and use the percent symbol to make the column type percent.

Question 2

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

Exercise: Managing Sales Data

1. Importing Data:

- Download a sample sales data CSV file from an online source.
- Open Excel and import the CSV file into a new worksheet.

2. Data Entry & Manipulation:

- In Column A, add a new column for "Product Category."
- Manually enter product categories for each item in the dataset.
- In Column E, add a new column for "Total Sales and calculate by using your respective column name ex: = B2 * C2". Use a formula to calculate the total sales for each item based on the quantity sold and unit price. Data Columns can be taken as below.

	A	B	C	D	E
1	Product Name	Quantity Sold	Unit Price	Total Sales	Product Category
2	Laptop	15	1200	18000	Electronics
3	T-Shirt	30	20	600	Clothing
4					
5					
6					
7					
8					

3. Sorting:

- Sort the data based on the "Product Name" in ascending order.
- Sort the data based on the "Total Sales" in descending order.

4. Filtering:

- Apply a filter to the dataset and filter out rows where the "Quantity Sold" is less than 10.
- Apply another filter to show only the rows where the "Product Category" is "Electronics."

5. Additional Manipulation:

- In Column F, calculate the commission for each sale (5% of total sales).

- Add a new column, "Profit Margin," and calculate the profit margin for each sale (Profit Margin = (Profit / Total Sales) * 100).

Question 3

Analyzing Sales Data with Data Validation, Pivot Tables, and Pivot Charts

Data Columns:

Assume the following columns in your spreadsheet:

- Column A: Product Name
- Column B: Category
- Column C: Sales Date
- Column D: Quantity Sold
- Column E: Unit Price
- Column F: Total Sales

Managing sales data for an online store. Implement the following tasks:

1. Data Validation:

- Set up data validation in Column B ("Category") to create a drop-down list of available product categories. This ensures that users can only select from predefined categories.

2. Pivot Table:

- Create a pivot table to analyze total sales by category and sales date. Place the "Category" field in the Rows area, the "Sales Date" field in the Columns area (grouped by months), and the "Total Sales" field in the Values area.

Steps**:** **Create the Pivot Table:**

- Select any cell within your data range.
- Go to the "Insert" tab in Excel.
- Click on "PivotTable."
- Ensure the "Create PivotTable" dialog box points to the correct range and choose where you want the pivot table (e.g., a new worksheet).
- Click "OK."

Set Up the Pivot Table Fields:

- In the PivotTable Field List: Drag the "Category" field to the Rows area.
- Drag the "Sales Date" field to the Columns area. Group it by months for better visualization.
- Drag the "Total Sales" field to the Values area. Ensure it's set to summarize as the sum.

3. Pivot Chart:

- Generate a pivot chart based on the pivot table you created. Choose a chart type that visually represents the total sales trends over time for each product category.

Steps:

Create the Pivot Chart:

- With your pivot table selected, go to the "Insert" tab.
- Click on "PivotChart."
- Choose the desired chart type (e.g., Line Chart or Column Chart).
- Ensure the chart fields are set up similarly to the pivot table, with "Category" on the x-axis and "Sales Date" values represented over time.

4. Additional Data Entry:

- Enter new sales data for a few additional products, ensuring that the "Category" field uses the data validation drop-down list.

Question 4:

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

Data Columns:

Provide following columns in the spreadsheet:

- Column A: EmployeeName
- Column B: Department
- Column C: EvaluationDate
- Column D: ProjectsCompleted
- Column E: AverageRating
- Column F: BonusAwarded

Task:

Analyzing employee performance data. Perform the following tasks:

1. Conditional Formatting:

- Apply conditional formatting to the "AverageRating" column (Column E) to highlight cells with ratings above 4.0 in green and below 3.0 in red.

Steps:

Select the Range: Select the cells in Column E where you want to apply the conditional formatting (e.g., E2:E100).

Open Conditional Formatting Menu: 1. Go to the "Home" tab in the Excel ribbon.

2.Click on "Conditional Formatting" in the toolbar.

3.Create a New Rule: Choose "New Rule" from the dropdown menu.

4.Set up the Rule for Ratings:

Above 4.0 in Green:	2. Below 3.0 in Red:
- Select the range (e.g., E2:E100). - Use the formula: `=E2>4` - Format with green fill.	- Select the same range. - Use the formula: `=E2<3` - Format with red fill.

2. What-If Analysis:

- In cell G1, create a cell named "SalaryIncreasePercentage."

- Implement a What-If Analysis by allowing users to enter different salary increase percentages in the "SalaryIncreasePercentage" cell and observe how it affects the bonus awarded. Use a formula to calculate the bonus with the salary increase.

Steps:

1. Create "SalaryIncreasePercentage" Cell:
   - In cell G1, type "SalaryIncreasePercentage" to label the cell.
2. Enter a Starting Value:
   - In cell G2, enter an initial percentage value (e.g., 0 for no increase).
3. Set Up Bonus Calculation Formula:
   - In an adjacent cell (let's say H2), use a formula to calculate the bonus with the salary increase. Assuming the original bonus is in Column F: =F2 * (1 + G2)
   - This formula multiplies the original bonus by (1 + SalaryIncreasePercentage) to calculate the new bonus with the specified percentage increase.
4. Copy Formulas:
   - Copy the formula in cell H2 down for other rows if needed.
5. Observe Changes:
   - As users enter different values in the "SalaryIncreasePercentage" cell (G2), the bonus amounts in column H will automatically update based on the specified increase.

3. Data Tables:

- Create a one-variable data table to display the impact of different salary increase percentages on the bonus awarded.

Steps:

1. Set Up Percentage Values:
   - In a column (say in column I), enter different salary increase percentages. For example, you might use the values 0%, 5%, 10%, 15%, and so on.

2. Enter the Data Table Formula:
   - In an adjacent column (say in column J), use the following formula to calculate the bonus with each percentage:
     =F2 * (1 + I2)
   - Copy this formula down for the entire column.

3. Select the Data Table Range:
   - Select the range that includes both the "SalaryIncreasePercentage" column (G2:G6) and the calculated bonus column (J2:J6).

4. Insert Data Table:
   - Go to the "Data" tab in the Excel ribbon.
   - Click on "What-If Analysis" and then select "Data Table."
   - In the "Row Input Cell" box, enter the reference to the cell containing the original bonus amount (e.g., F2).

4. Charts & Graphs:

- Create a bar chart to visualize the average ratings for each department.
- Create a line chart to show the trend of projects completed over time.

Question 5:

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

Cleaning Employee Data - Consider dataset with employee information in an Excel spreadsheet. The data is not consistent, and need to clean it using various text functions.

Data:

Assume the following columns in your spreadsheet:

- Column A: Employee ID
- Column B: First Name
- Column C: Last Name
- Column D: Department
- Column E: Job Title

Task:

1. UPPER and LOWER Functions:
   - In Column F, use the UPPER function to convert all values in the "Department" column (Column D) to uppercase.
   - In Column G, use the LOWER function to convert all values in the "Job Title" column (Column E) to lowercase.
   - Syntax: `=UPPER(text)` , `=LOWER(text)` and Example: `=UPPER(D2)` converts the value in cell D2 to uppercase.

2. TRIM Function:
   - In Column H, use the TRIM function to remove any leading or trailing spaces in the "First Name" column (Column B).
Syntax: `=TRIM(text)` and Example: `=TRIM(B2)` removes leading and trailing spaces from the value in cell B2.

3. Concatenate Function:
   - In Column I, use the CONCATENATE function to create a new column "Full Name" by combining the "First Name" and "Last Name" columns (Columns B and C). Separate the names with a space.
Syntax: `=CONCATENATE (text1, [text2], ...) ` and Example: `=CONCATENATE (B2, " ", C2) ` combines the values in cells B2 and C2 with a space in between to create a full name.

Question 6:

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

Cleaning Date and Time Data - Consider the dataset with employee attendance information in an Excel spreadsheet. The date and time values are not in a consistent format, and need to clean and standardize them using various date and time functions.

Data:
Assume the following columns in your spreadsheet:

- Column A: Employee ID
- Column B: Check-in Date
- Column C: Check-in Time

Task:

1. DATEVALUE Function:
   - In Column D, use the DATEVALUE function to convert the text in the "Check-in Date" column (Column B) to a proper date format.

2. TIMEVALUE Function:
   - In Column E, use the TIMEVALUE function to convert the text in the "Check-in Time" column (Column C) to a proper time format.

3. DATEADD Function:
   - In Column F, use the DATEADD function to add 1 day to the cleaned date in Column D (for example, if the original date is in B2, use `=DATEADD(D2, 1)`).

4. DATEDIF Function:
   - In Column G, use the DATEDIF function to calculate the difference in days between the original date in Column B and the cleaned date in Column D (for example, if the original date is in B2 and the cleaned date is in D2, use `=DATEDIF(B2, D2, "d")`).

Question 7:

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

Part A

Analyzing Weather Data - Consider dataset containing daily weather observations in an Excel spreadsheet. The data is not consistent, and need to analyze and format it for better understanding.

Data:
Assume the following columns in your spreadsheet:

Column A: Date
Column B: Temperature (in Celsius)
Column C: Humidity (%)
Column D: Wind Speed (in km/h)
Column E: Precipitation (in mm)

Task:
Conditional Formatting - Temperature:
Apply conditional formatting to the "Temperature" column (Column B) to highlight cells with temperatures above 30°C in red, indicating hot weather, and below 10°C in blue, indicating cold weather.

Parsing Date:
In Column F, use text functions to parse the day of the week from the "Date" column (Column A). Display the day of the week in Column F.

Conditional Formatting - Precipitation:
Apply conditional formatting to the "Precipitation" column (Column E) to highlight cells with precipitation values above 5 mm in yellow, indicating significant rainfall.

Conditional Formatting - Wind Speed:
Apply conditional formatting to the "Wind Speed" column (Column D) to highlight cells with wind speeds above 40 km/h in orange, indicating strong winds.

Part B

Analyzing Product Sales Data – Consider dataset containing product sales information in an Excel spreadsheet. The data is not consistent, and you need to analyze and format it for better understanding.

Data:
Assume the following columns in your spreadsheet:

- Column A: Product Code
- Column B: Product Name
- Column C: Sales Date
- Column D: Units Sold
- Column E: Revenue

Task:

1. Conditional Formatting - High Revenue Products:
   - Apply conditional formatting to the "Revenue" column (Column E) to highlight cells with revenue above $5,000 in green, indicating high revenue products.

2. Parsing Month from Sales Date:
   - In Column F, use text functions to parse the month from the "Sales Date" column (Column C). Display the month in Column F.

3. Conditional Formatting - Low Sales:
   - Apply conditional formatting to the "Units Sold" column (Column D) to highlight cells with units sold below 20 in red, indicating low sales.

4. Conditional Formatting - Recent Sales:
   - Apply conditional formatting to the "Sales Date" column (Column C) to highlight cells with sales dates within the last 30 days in blue, indicating recent sales.

Question 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

Data: Assume you have a workbook with two sheets:

Sheet 1 - Sales Data:

- Column A: Product Code
- Column B: Product Name
- Column C: Sales Date
- Column D: Units Sold
- Column E: Revenue

Sheet 2 - Product Details:

- Column A: Product Code
- Column B: Category
- Column C: Manufacturer
- Column D: Cost Price
- Column E: Stock Quantity

Task:

1. VLOOKUP for Product Details:

- In Sheet 1, create a new column (Column F) titled "Category" and use the VLOOKUP function to fetch the corresponding category from Sheet 2 based on the Product Code.

2. SUMIFS for Total Revenue by Category:

- In Sheet 2, create a summary table with unique categories in one column (let's say Column G) and use the SUMIFS function to calculate the total revenue for each category from Sheet 1.

3. Linking Cells Between Sheets:

- In Sheet 1, create a hyperlink in a new cell that links to the relevant row in Sheet 2 for detailed product information. Use the HYPERLINK function.

4. Pivot Table for Sales Analysis:

- In a new sheet (Sheet 3), create a Pivot Table using the data from Sheet 1 to analyze total revenue by product and month. Rows can be product names, columns can be months (extracted from the Sales Date), and values can be the sum of revenue.

5. Conditional Formatting - Out-of-Stock Products:

- In Sheet 2, apply conditional formatting to the "Stock Quantity" column (Column E) to highlight cells with stock quantities below 10 in red, indicating low stock.

Question 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.

Step 1: Create the Worksheet

Label the columns with the following headers:

Cell A1- Empno
Cell B1- Ename
Cell C1- Basic Pay (BP)
Cell D1- Travelling Allowance (TA)
Cell E1- Dearness Allowance (DA)
Cell F1- House Rent Allowance (HRA)
Cell G1- Income Tax (IT)
Cell H1- Provident Fund (PF)
Cell I1- Net Pay (NP)

Step 2- Enter Sample Data

Step 3- Formulas for Salary Components

A. In cell E2, enter the formula for calculating Dearness Allowance (DA) - =C2*0.1 .This assumes DA is 10% of the Basic Pay.

B. In cell F2, enter the formula for calculating House Rent Allowance (HRA)- =C2*0.15 . This assumes HRA is 15% of the Basic Pay.

C . In cell G2, enter the formula for calculating Income Tax (IT). Adjust the formula based on your tax calculation method.

D. In cell H2, enter the formula for calculating Provident Fund (PF)- =C2*0.12 . This assumes PF is 12% of the Basic Pay.

E. In cell I2, enter the formula for calculating Net Pay (NP) - =C2+D2+E2+F2Column(G2+H2) This formula calculates Net Pay by summing up the components and subtracting deductions.

Step 4- Create a Chart

1. Select the data range including headers (A1-I6).

2. Go to the "Insert" tab in the Excel ribbon and choose the appropriate chart type (e.g., bar chart, pie chart) from the "Charts" section.

Step 5- Analyze and Report

1. Customize the chart as needed and add labels, titles, and legends.

2. Analyze the chart to understand the distribution of salary components.

Follow the below steps -

1. Customize the Chart-

1. Select the Chart-
   Column Click on the chart to select it.

2. Chart Tools-
   Column The "Chart Tools" options will appear in the ribbon when the chart is selected.

3. Chart Title-
   Column Click on the chart title (if any) and edit it to something like "Salary Components Distribution."

4. Axis Labels-
   Column Click on the axis labels (XColumnaxis and YColumnaxis) to edit or format them. For the XColumnaxis, you might want to use employee names (Ename), and for the YColumnaxis, use the salary components.

5. Data Labels-
   Column Add data labels to the chart to display the exact values on each data point. RightColumnclick on a data point, choose "Add Data Labels."

6. Legend-
   Column If not automatically generated, add a legend to the chart. The legend should identify the different components of the salary.

7. Chart Style-
   Column Experiment with different chart styles to find one that best represents the data. RightColumnclick on the chart, choose "Change Chart Type," and explore various options.

8. Color Scheme-
   Column Choose a color scheme that is easy to understand and visually appealing. RightColumnclick on different elements of the chart, such as bars or pie slices, and change their colors.

2. Analyze the Chart-

1. Identify Patterns-
Column Look for patterns in the chart. Are certain salary components consistently higher or lower for different employees?

2. Compare Components-
Column Compare the sizes of different components for each employee. Are there employees with a higher proportion of Basic Pay compared to others?

3. Identify Outliers-
Column Check for outliers, i.e., employees with significantly higher or lower total compensation. This could be due to high or low values in specific components.

Question 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. Analyze the data using appropriate chart and report the data.

Step 1: Set Up the Worksheet
1. Column Headers:
- A: Product Code
- B: Product Name
- C: Product Type
- D: MRP (Maximum Retail Price)
- E: Cost after % Discount
- F: Date of Purchase

Step 2: Data Entry

Enter your product information into the respective columns.

Step 3: Calculate Cost after % Discount

1. Select Cell E2 (Cost after % Discount).
2. Enter the following formula: =D2*(1-DiscountPercentage)

Assume a cell (say G1) where you input the discount percentage.

Step 4: Enter the Date of Purchase

1. Select Cell F2 (Date of Purchase).
2. Enter the purchase date using the appropriate date format.

Step 5: Analyzing Data with Charts

1. Select the data range (A1:F? where "?" is the last row of your data).
2. Go to the "Insert" tab on the Excel ribbon.
3. Choose the chart type that best suits your data. A bar chart or a line chart may be suitable for this scenario.

Step 6: Create a Report

1. Analysis Section:
Analyze the data. For example, you can calculate the total cost, average cost, etc.

2. Reporting Section:
- Create a report summarizing your findings.

Step 7: Formulas for Analysis

To calculate the total and average cost, use the following formulas: - Total Cost: =SUM(E2:E?) Replace "?" with the last row of your data.

- Average Cost: =AVERAGE(E2:E?) Replace "?" with the last row of your data.

Step 8: Formatting

1. Format Currency:
   - Select the "Cost after % Discount" column (Column E).
   - Go to the "Home" tab on the Excel ribbon.
   - In the Number group, click the dropdown menu and choose the currency format.

2. Format Date:
   - Select the "Date of Purchase" column (Column F).
   - Go to the "Home" tab.
   - In the Number group, choose the date format that suits your preference.

3. Add Titles and Labels to the Chart:
   - Click on the chart to select it.
   - Go to the "Chart Tools Design" tab.
   - Enter a title for your chart by clicking on "Add Chart Element" > "Chart Title."
   - Label your axes by selecting "Axis Titles" under "Add Chart Element."

4. Adjust Chart Style:
   - Customize the appearance of your chart by choosing a style from the "Chart Styles" group.

Question 11

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.

Sales Analysis Worksheet:

1. Organize Data:
   - Arrange your data in a worksheet with appropriate column headers.

2. Create Formulas:
   - Use formulas to segregate different categories. For example, use the `MONTH` function to extract the month from the "Date of Order."
     =MONTH(E2)
   - Use formulas to categorize or calculate values based on your analysis needs.

3. Pivot Table:
   - Select your data range.
   - Insert a pivot table (`Insert` -> `Pivot Table`).
   - Drag relevant fields to the Rows, Columns, and Values areas based on your analysis requirements.

4. Comparative Study:
   - Use the pivot table to perform a comparative study. For example, compare total sales by product category or analyze sales trends over different months.

5. Charts:
   - Create charts based on your analysis. For example, use a bar chart to visualize total sales by product category or a line chart to show sales trends over months.
     - Select the data.
     - Go to the `Insert` tab and choose the desired chart type.

Example Pivot Table Fields:
   - Rows: Product Category, Month
   - Values: Sum of Amount

Example Chart:
   - A bar chart showing total sales by product category.

Question 12

Generation of report & presentation using Autofilter &macro.
Step 1: Organize Your Data

Ensure your data is organized in a tabular format with column headers. For example:

	A	B	C	D
1	Product Id	Product Name	Category	Price
2	101	Widget A	Electronics	₹ 400.00
3	102	Widget B	Kitchen	₹ 250.00
4	103	Widget C	Garden	₹ 100.00
5	104	Widget D	BedRoom	₹ 1,700.00
6	105			
7	106			
8	107			

Step 2: Enable Autofilter

- Select the data range.
- Go to the "Data" tab.
- Click on "Filter" or "Sort & Filter" (depending on your Excel version).

Step 3: Apply Autofilter

Use the Autofilter to filter data based on your criteria. For example, filter the "Category" column to show only "Electronics."

Step 4: Record a Macro

- Go to the "View" tab.
- Click on "Macros" and select "Record Macro."
- Name your macro (e.g., "GenerateReport").
- Choose a location for the macro (e.g., "This Workbook").
- Click "OK" to start recording.

Step 5: Perform Actions

Perform the actions you want to include in the macro. For example, select and copy the filtered data.

Step 6: Stop Recording

- Go back to the "View" tab.
- Click on "Macros" and select "Stop Recording."

Step 7: Run the Macro

- Go to the "View" tab.
- Click on "Macros" and select "View Macros."
- Select your macro ("GenerateReport").
- Click "Run."

Step 8: Create a Presentation

- Open PowerPoint or any presentation software.
- Create a new slide.
- Paste the copied data onto the slide.

Step 9: Customize and Format

Format the data on the slide to make it presentable. Add titles, labels, and any additional information you want to include.

VIVA QUESTIONS:

1. Excel Basics and Functions:

1. Question: What is the purpose of the VLOOKUP function?
   - Answer: VLOOKUP is used to search for a value in the first column of a range and return a corresponding value in the same row from another column.

2. Question: Explain the difference between CONCATENATE and "&" in Excel.
   - Answer: CONCATENATE and "&" both combine text, but "&" is a more concise and commonly used method for text concatenation.

3. Question: How do you insert a new row or column in Excel?
   - Answer: Right-click on the row or column header where you want to insert a new row or column and choose "Insert."

2. Data Analysis and Cleaning:

4. Question: How can you remove leading and trailing spaces from a text string?
   - Answer: You can use the TRIM function to remove leading and trailing spaces from a text string.

5. Question: What is conditional formatting, and how can it be applied in Excel?
   - Answer: Conditional formatting is a feature in Excel that allows you to format cells based on specific conditions. It can be applied through the "Conditional Formatting" menu in the Home tab.

3. Working with Multiple Sheets:

6. Question: How can you link cells between different sheets in Excel?
   - Answer: You can use the HYPERLINK function or simply enter '=SheetName!CellReference' to link to a specific cell in another sheet.

7. Question: Explain the purpose of using multiple sheets within a workbook.
   - Answer: Multiple sheets in a workbook help organize and manage data, perform complex calculations, and create comprehensive reports by separating different types of information.

4. Pivot Tables and Charts:

8. Question: What is the purpose of a Pivot Table in Excel?
   - Answer: A Pivot Table is used to summarize and analyze large datasets. It allows users to reorganize and aggregate data dynamically.

9. Question: How can you create a Pivot Chart based on a Pivot Table?
- Answer: After creating a Pivot Table, select any cell within the table and go to the "Insert" tab. Choose "PivotChart" and select the desired chart type.

5. Data Validation:

10. Question: Explain the use of Data Validation in Excel.
- Answer: Data Validation is used to control the type of data or the values that users can enter into a cell. It helps ensure data accuracy and consistency.

6. Cleaning Data with Text Functions:

11. Question: How does the UPPER function work in Excel, and in what scenario would you use it?
- Answer: The UPPER function converts text to uppercase. It's useful when you want to standardize the case of text data.

12. Question: Explain the purpose of the LOWER function in Excel.
- Answer: The LOWER function converts text to lowercase, ensuring consistency in text data.

13. Question: When would you use the CONCATENATE function, and how does it differ from using the "&" operator?
- Answer: CONCATENATE and "&" combine text strings. However, CONCATENATE allows combining more than two strings, while "&" is a shorthand method for concatenation.

7. Cleaning Data Containing Date and Time Values:

14. Question: What does the DATEVALUE function do, and how can it be used in Excel?
- Answer: DATEVALUE converts a date represented as text into a serial number that Excel recognizes as a date.

15. Question: Explain the purpose of the DATEDIF function in Excel.
- Answer: DATEDIF calculates the difference between two dates in terms of years, months, or days.

8. Data Analysis Process:

16. Question: How does Conditional Formatting enhance data analysis in Excel?
- Answer: Conditional Formatting visually highlights and emphasizes specific data points based on set conditions, aiding in quick data interpretation.

17. Question: What is the purpose of What-If Analysis in Excel, and how can it be performed?
- Answer: What-If Analysis is used to explore various scenarios by changing input values. It can be done through tools like Goal Seek or Scenario Manager.

9. Working with Data: Importing, Entry, and Manipulation:

18. Question: How can you import external data into Excel?
- Answer: External data can be imported using the "Data" tab, where options like "Get Data" or "From Text" allow importing data from various sources.

19. Question: Explain the importance of sorting and filtering data in Excel.
- Answer: Sorting arranges data in a specific order, and filtering allows you to display only the data that meets certain criteria, facilitating analysis.

10. Generation of Reports and Presentation:

20. Question: How can you use Autofilter to analyze data in Excel?
- Answer: Autofilter allows users to filter data quickly by selecting criteria from a dropdown list in the column headers, making data analysis more efficient.

21. Question: What is the role of a macro in Excel, and how can it be created?
- Answer: A macro is a set of instructions that automates tasks. It can be created by recording a series of actions or by writing VBA (Visual Basic for Applications) code.