Homework Assignment: Excel Formulas and Data Visualization

Objective:

Students will use Microsoft Excel to enter data, apply common formulas (SUM, AVERAGE, MAX, MIN, IF, COUNTIF, ROUND, and RANK), and create charts to visualize information.

Instructions:

Part 1: Data Entry and Formulas

1. Open Microsoft Excel and create a new spreadsheet.
2. Enter the following data into a table:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Student | Math Score | Science Score | English Score | History Score | Total Score | Average Score | Rounded Avg | Rank | Pass/Fail |
| Alice | 85 | 78 | 92 | 88 |  |  |  |  |  |
| Bob | 72 | 80 | 85 | 70 |  |  |  |  |  |
| Charlie | 90 | 95 | 88 | 94 |  |  |  |  |  |
| David | 60 | 65 | 70 | 75 |  |  |  |  |  |
| Emma | 78 | 85 | 80 | 82 |  |  |  |  |  |
| Frank | 88 | 92 | 85 | 90 |  |  |  |  |  |
| Grace | 55 | 60 | 62 | 58 |  |  |  |  |  |
| Henry | 98 | 94 | 99 | 95 |  |  |  |  |  |

Part 2: Applying Formulas

Use the following formulas to fill in the missing columns:

1. Total Score: Calculate the total score for each student. *(Hint: Use the SUM function.)*
   * Example formula: =SUM(B2:E2)
2. Average Score: Compute the average score for each student. *(Hint: Use the AVERAGE function.)*
   * Example formula: =AVERAGE(B2:E2)
3. Rounded Average: Round the average score to the nearest whole number. *(Hint: Use the ROUND function.)*
   * Example formula: =ROUND(F2,0)
4. Pass/Fail: Determine if a student passes. A passing score is 75 or higher. *(Hint: Use the IF function.)*
   * Example formula: =IF(G2>=75, "Pass", "Fail")
5. Rank: Rank the students based on their average score. *(Hint: Use the RANK function.)*
   * Example formula: =RANK(G2, G$2:G$9, 0)

Part 3: Additional Formulas for Data Analysis

1. Class Statistics (Below the Table)
   * Calculate the highest score in the Average Score column. *(Hint: Use MAX function.)*
     + Example formula: =MAX(G2:G9)
   * Calculate the lowest score in the Average Score column. *(Hint: Use MIN function.)*
     + Example formula: =MIN(G2:G9)
   * Count how many students passed. *(Hint: Use COUNTIF function.)*
     + Example formula: =COUNTIF(H2:H9, "Pass")
   * Count how many students failed. *(Hint: Use COUNTIF function.)*
     + Example formula: =COUNTIF(H2:H9, "Fail")

Part 4: Data Visualization

1. Create a Bar Chart
   * Display each student's total score on a bar chart.
   * Label the x-axis with student names and the y-axis with scores.
2. Create a Pie Chart

* Show the percentage of students who passed versus failed.

1. Create a Line Chart

* Display the average scores of all students on a line chart to visualize score distribution.

Part 5: Analysis Questions

Answer the following questions in a separate Excel sheet:

1. Which student has the highest average score?
2. Which student has the lowest average score?
3. What is the class average for all students? *(Hint: Use AVERAGE function on the "Average Score" column.)*
4. How many students scored above 90 in Math? *(Hint: Use COUNTIF function.)*
5. What percentage of students passed? *(Hint: Use a formula to divide the number of passing students by the total number of students.)*
6. What is the difference between the highest and lowest average scores? *(Hint: Subtract the MIN from the MAX.)*
7. If the passing score was increased to 80, how many students would still pass? *(Try modifying your Pass/Fail column to test this.)*

Submission Requirements:

* Submit your Excel file (.xlsx) with:
  + All formulas correctly applied (no manually entered values).
  + All charts properly formatted with clear labels.
  + Answers to analysis questions