



Lab 06: Introduction to Excel Formulas, Functions, Data Visualization, and Data Manipulation

Subject: Application of Information & Communication Technologies

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Introduction to Formulas and Calculations

Definition: Excel formulas are expressions used for performing calculations on data. They are initiated with an equal sign (=).

Example (Addition): =10 + 5

Formula Example =A1 + B1

1. Start a formula with an equal sign.
2. Specify the cell references or values to be operated on.
3. Use mathematical operators like +, -, *, or / for calculations.
4. Press Enter to see the result.

Example: If A1 contains 5 and B1 contains 3, =A1 + B1 will yield 8.

Basic Arithmetic Operations

Definition: Excel supports basic arithmetic operations, including addition (+), subtraction (-), multiplication (*), and division (/).

Formula Examples:

- Addition: =A1 + B1
- Subtraction: =A2 - B2
- Multiplication: =A3 * B3
- Division: =A4 / B4

Step-by-Step Example (Multiplication):

1. Start a formula with an equal sign.
2. Specify cell references or values to be multiplied.

3. Use the * operator.
4. Press Enter to see the result.

Example: If A3 contains 10 and B3 contains 5, =A3 * B3 will yield 50

Using Cell References in Formulas

Cell references in Excel formulas enable dynamic calculations by referring to specific cells.

Formula Example: =A1 * B1

Step-by-Step Example:

1. Start a formula with an equal sign.
2. Specify cell references to use in the calculation.
3. Use mathematical operators for the calculation.
4. Press Enter to see the result.

Example: If A1 contains 8 and B1 contains 4, =A1 * B1 will yield 32.

Common Functions

Definition: Excel provides built-in functions like SUM, AVERAGE, COUNT, MAX, and MIN for specific calculations.

Formula Example (SUM): SUM(A1:A5)

Step-by-Step Example (SUM):

1. Start a formula with an equal sign.
2. Use the SUM function and specify the range of cells.
3. Press Enter to calculate the sum.

Example (SUM): If A1 to A5 contain values 10, 15, 20, 25, and 30, =SUM (A1:A5) will yield 100.

AVERAGE =AVERAGE (A1:A5)

Step-by-Step Example (AVERAGE):

1. Start a formula with an equal sign.
2. Use the AVERAGE function and specify the range of cells.
3. Press Enter to calculate the average.

Example (AVERAGE): If A1 to A5 contain values 10, 15, 20, 25, and 30, =AVERAGE(A1:A5) will yield an average of 20.

Formula Example (COUNT): =COUNT(A1:A5)

Step-by-Step Example (COUNT):

1. Start a formula with an equal sign.
2. Use the COUNT function and specify the range of cells.
3. Press Enter to count the number of cells with values.

Example (COUNT): If A1 to A5 contain values, =COUNT(A1:A5) will count the number of cells with values.

Formula Example (MAX): =MAX(A1:A5)

Step-by-Step Example (MAX):

1. Start a formula with an equal sign.
2. Use the MAX function and specify the range of cells.
3. Press Enter to find the maximum value.

Example (MAX): If A1 to A5 contain values, =MAX(A1:A5) will find the maximum value among them.

Formula Example (MIN): =MIN(A1:A5)

Step-by-Step Example (MIN):

1. Start a formula with an equal sign.
2. Use the MIN function and specify the range of cells.
3. Press Enter to find the minimum value.

Example (MIN): If A1 to A5 contain values, =MIN(A1:A5) will find the minimum value among them.

IF Function

Definition: The IF function performs conditional calculations based on a specified condition.

Formula Example: =IF(A1 >= 70, "Pass", "Fail")

Step-by-Step Example:

1. Start a formula with an equal sign.
2. Use the IF function and define a condition.

3. Specify the value if the condition is true and the value if it's false.
4. Press Enter to get the result.

Example: If A1 contains 75, =IF(A1 >= 70, "Pass", "Fail")` will yield "Pass."

COUNTIF Function

Definition: COUNTIF counts the number of cells in a range that meet a specified criterion.

Formula Example: =COUNTIF(A1:A10, "P")

Step-by-Step Example:

1. Start a formula with an equal sign.
2. Use the COUNTIF function and specify the range and criteria.
3. Press Enter to count cells that meet the criteria.

Example: If A1 to A10 contain values "P," "A," "P," "P," "A," and so on, =COUNTIF(A1:A10, "P")` will yield the count of "P"s , 3.

Data Visualization

Definition: Data visualization involves representing data using charts and graphs to facilitate understanding.

Chart Examples:

- Create a Bar Chart to compare data points.
- Create a Line Chart to show trends over time.
- Create a Pie Chart to display proportions.

Step-by-Step Example (Bar Chart):

1. Select the data to be charted.
2. Go to the "Insert" tab and choose the desired chart type.
3. Customize the chart by adding titles, labels, and colors.

Example: Create a bar chart to visualize monthly sales figures, and customize it with titles, labels, and different colors for clarity.

Data Manipulation

Definition: Data manipulation involves actions like sorting, filtering, and using criteria to extract specific information from datasets.

Sort Data Example (Ascending):

1. Select the data to be sorted.
2. Go to the "Data" tab and click "Sort A to Z" for ascending order.

Filter Data Example:

1. Select the dataset.
2. Go to the "Data" tab and click "Filter" to apply filters.
3. Click the filter dropdowns to display specific data.