**Learning Data Analysis with Excel: Basic Formulas**

**Research using Google and ChatGPT**

**Basic Excel Formulas**

**1. SUMIF**

**Purpose**: The SUMIF formula adds up values in a range that meets a specific criterion.

**Syntax**:

=SUMIF(range, criteria, sum\_range)

* **range**: The range of cells to evaluate.
* **criteria**: The condition that must be met.
* **sum\_range**: The range of cells to sum if the condition is met.

**Example**: If we want to calculate the total sales for a specific product line, we use:

=SUMIF(supermarket\_sales!F2:F1001, "Health and beauty", supermarket\_sales!J2:J1001)

This adds up all sales for the "Health and beauty" product line.

**2. COUNTIF**

**Purpose**: The COUNTIF formula counts the number of cells that meet a specific condition.

**Syntax**:

=COUNTIF(range, criteria)

* **range**: The range of cells to count.
* **criteria**: The condition that must be met.

**Example**: If we want to count how many customers belong to the "Normal" customer type:

=COUNTIF(supermarket\_sales!D2:D1001, "Normal")

This counts all occurrences of "Normal" in the customer type column.

**3. COUNTA**

**Purpose**: The COUNTA formula counts the number of non-empty cells in a range.

**Syntax**:

=COUNTA(range)

* **range**: The range of cells to count.

**Example**: If we want to count the total number of entries in our sales data:

=COUNTA(supermarket\_sales!A2:A1001)

This counts all non-empty cells in the range.

**4. AVERAGEIFS**

**Purpose**: The AVERAGEIFS formula calculates the average of values in a range that meet multiple criteria.

**Syntax**:

=AVERAGEIFS(average\_range, criteria\_range1, criteria1, [criteria\_range2, criteria2], ...)

* **average\_range**: The range of cells to average.
* **criteria\_range1**: The first range of cells to evaluate.
* **criteria1**: The first condition that must be met.
* **criteria\_range2, criteria2, ...**: Additional ranges and conditions.

**Example**: To find the average sales for "Normal" customers who paid by "Credit card":

=AVERAGEIFS(supermarket\_sales!J2:J1001, supermarket\_sales!D2:D1001, "Normal", supermarket\_sales!M2:M1001, "Credit card")

This calculates the average sales for these specific conditions.

**5. SUMIFS**

**Purpose**: The SUMIFS formula adds up values in a range that meet multiple criteria.

**Syntax**:

=SUMIFS(sum\_range, criteria\_range1, criteria1, [criteria\_range2, criteria2], ...)

* **sum\_range**: The range of cells to sum.
* **criteria\_range1**: The first range of cells to evaluate.
* **criteria1**: The first condition that must be met.
* **criteria\_range2, criteria2, ...**: Additional ranges and conditions.

**Example**: To calculate the total sales for female customers in the city of Yangon:

=SUMIFS(supermarket\_sales!J2:J1001, supermarket\_sales!E2:E1001, "Female", supermarket\_sales!C2:C1001, "Yangon")

This sums all sales that meet these conditions.

**Applying the Formulas to Sales Data**

**1. Total Sales by Branch**

To calculate the total sales by branch, we sum the sales amounts for each branch using the SUMIF formula:

=SUMIF(supermarket\_sales!F2:F1001, Report!B11, supermarket\_sales!J2:J1001)

This adds up all sales for the branch specified in Report!B11.

**2. % of Customers by Customer Type**

To find the percentage of customers by customer type, we use:

=COUNTIF(supermarket\_sales!D2:D1001, E5)/COUNTA(supermarket\_sales!D2:D1001)

This calculates the proportion of customers of a specific type out of all customers.

**3. Total Quantity by Product Line**

To calculate the total quantity sold by product line, we use:

=SUMIF(supermarket\_sales!F2:F1001, Report!B11, supermarket\_sales!H2:H1001)

This adds up the quantities sold for the product line specified in Report!B11.

**4. Average Sales by Payment and Customer Type**

To find the average sales by payment method and customer type, we use:

=AVERAGEIFS(supermarket\_sales!J2:J1001, supermarket\_sales!D2:D1001, Report!$F$10, supermarket\_sales!M2:M1001, Report!E11)

This calculates the average sales for customers of a specific type using a specific payment method.

**5. Total Sales by Gender for Each City**

To calculate the total sales by gender for each city, we use:

=SUMIFS(supermarket\_sales!J2:J1001, supermarket\_sales!E2:E1001, Report!$C$19, supermarket\_sales!C2:C1001, Report!B21)

This sums the sales for customers of a specific gender in a specific city.