**Week 5: Advanced Formulas and Functions**

**Dataset:** Sales Data

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Order ID** | **Customer Name** | **Region** | **Product** | **Quantity** | **Unit Price** | **Order Date** | **Sales Rep** |
| 1001 | John Smith | North | Laptop | 5 | 1200 | 2024-01-15 | Alice Brown |
| 1002 | Jane Doe | East | Smartphone | 10 | 800 | 2024-02-10 | Bob Johnson |
| 1003 | Dave Green | South | Tablet | 7 | 400 | 2024-03-05 | Charlie Black |
| 1004 | Lucy White | West | Monitor | 12 | 150 | 2024-04-20 | Eve White |
| 1005 | Peter Black | North | Keyboard | 20 | 50 | 2024-05-30 | Frank Green |
| 1006 | Anna Yellow | East | Laptop | 3 | 1200 | 2024-06-15 | Grace Blue |
| 1007 | Mike Purple | South | Smartphone | 8 | 800 | 2024-07-01 | Hank Purple |
| 1008 | Sarah Blue | West | Tablet | 5 | 400 | 2024-07-20 | Ivy Orange |
| 1009 | Chris Red | North | Monitor | 10 | 150 | 2024-08-15 | Jane Smith |
| 1010 | Emily Green | East | Keyboard | 15 | 50 | 2024-09-05 | John Doe |
| 1011 | Robert Brown | South | Laptop | 4 | 1200 | 2024-10-15 | Kate Yellow |
| 1012 | Katie Black | West | Smartphone | 9 | 800 | 2024-11-10 | Luke Cyan |

**Exercises for Advanced Formulas and Functions:**

**1. Calculate Total Sales**

Objective: Calculate the total sales for each order.

Steps:

1. Add a new column titled "Total Sales."

2. In the first cell of "Total Sales," use the formula `=Quantity \* Unit Price`.

3. Drag the formula down to fill the rest of the column.

**2. Calculate Average Sales per Region**

Objective: Find the average sales amount for each region.

Steps:

1. Use the `AVERAGEIFS` function.

2. Formula example: `=AVERAGEIFS(Dataset[Total Sales], Dataset[Region], "North")` for North region.

3. Repeat for other regions.

**3. Extract Month and Year from Order Date**

Objective: Extract and display the month and year from the order date.

Steps:

1. Add new columns titled "Order Month" and "Order Year."

2. Use the formulas `=MONTH(Order Date)` and `=YEAR(Order Date)` respectively.

3. Drag the formulas down to fill the rest of the columns.

**4. Find Highest and Lowest Sales**

Objective: Identify the highest and lowest sales amounts.

Steps:

1. Use the `MAX` and `MIN` functions.

2. Formula example: `=MAX(Dataset[Total Sales])` and `=MIN(Dataset[Total Sales])`.

**5. Count Orders per Sales Rep**

Objective: Count the number of orders handled by each sales rep.

Steps:

1. Use the `COUNTIF` function.

2. Formula example: `=COUNTIF(Dataset[Sales Rep], "Alice Brown")` for Alice Brown.

3. Repeat for other sales reps.

**6. Calculate Total Quantity Sold by Product**

Objective: Calculate the total quantity sold for each product.

Steps:

1. Use the `SUMIF` function.

2. Formula example: `=SUMIF(Dataset[Product], "Laptop", Dataset[Quantity])` for Laptops.

3. Repeat for other products.

**7. Apply Conditional Formatting for High Sales**

Objective: Highlight orders with sales greater than $5,000.

Steps:

1. Select the "Total Sales" column.

2. Go to "Home" > "Conditional Formatting" > "New Rule."

3. Use a formula to determine which cells to format: `=Total Sales > 5000`.

4. Set the desired formatting.

**8. Calculate Percentage Contribution to Total Sales**

Objective: Calculate each order's percentage contribution to the total sales.

Steps:

1. Add a new column titled "Percentage Contribution."

2. Use the formula `=Total Sales / SUM(Dataset[Total Sales])`.

3. Drag the formula down to fill the rest of the column.

**9. Create a Dynamic Dropdown List**

Objective: Create a dropdown list of unique product names.

Steps:

1. Select a cell for the dropdown list.

2. Go to "Data" > "Data Validation."

3. Choose "List" and use the `UNIQUE` function to generate the list: `=UNIQUE(Dataset[Product])`.

**10. Calculate Year-over-Year Sales Growth**

Objective: Calculate the year-over-year sales growth for each region.

Steps:

1. Add new columns titled "Previous Year Sales" and "YoY Growth."

2. Use the `OFFSET` and `SUMIFS` functions to calculate previous year sales.

3. Use the formula `=(This Year Sales - Previous Year Sales) / Previous Year Sales` for YoY Growth.