Level 1: Basic Excel & Formulas

Objective: Learn the basic Excel functions and formulas using the customer and sales data.
Dataset: Use the customer_master.csv and sales_data.csv for these tasks.
Tasks:

- Basic Formulas:
  a. Calculate the Total Revenue for each transaction (Quantity × Unit Price).
  b. Calculate Average Spending per Month for customers (customer_master.csv file).
- Data Aggregation:
  a. Count the total number of customers in customer_master.csv.
  b. Calculate the total units sold for each category in the sales data using a SUMIF formula.
- Conditional Formatting:
  a. Apply conditional formatting to highlight high spenders (e.g., spending > $1,000).
  b. Highlight customers who have missing zip codes.
- Date Functions:
  a. Extract the year from the viewed_datetime and purchased_datetime fields in sales_data.csv.
  b. Calculate the time difference between viewed_datetime and purchased_datetime.

Level 2: Data Cleaning & Transformation

Objective: Apply data cleaning techniques to transform raw data into useful insights.
Dataset: Use the customer_master.csv and sales_data.csv.
Tasks:

- Remove Duplicates:
  a. Identify and remove duplicates in both the Customer Master and Sales Data using the Remove Duplicates feature.
- Handle Missing Data:
  a. For the zipcode column in customer_master.csv, impute missing zip codes with the mode.
  b. For missing cart_added_datetime or purchased_datetime, either drop those rows or fill with an average time gap.
- Normalize Data:
  a. Standardize the zipcode to ensure it's 5 digits (U.S. format).
  b. Apply text cleanup for customer names, addresses, and cities to remove extra spaces and apply proper case formatting.
- Format Dates:
  a. Ensure the sequence viewed_datetime < cart_added_datetime < purchased_datetime in sales_data.csv. Flag rows that do not follow this sequence.

Level 3: Pivot Tables & Aggregation

Objective: Summarize data and gain insights using Pivot Tables and calculated fields.
Dataset: Use the sales_data.csv.
Tasks:

- **Create a Pivot Table to summarize sales data:**
  a. Group by Month and calculate total sales (quantity × unit price), average unit price, and average order value.
  b. Create a pivot chart to visually represent the total sales by Month.
- **Multi-Level Pivoting:**
  a. Create a pivot table to analyze Sales by Category and Customer.
  b. Use calculated fields to determine Conversion Rate (purchases/views) and Cart Abandonment Rate.
- **Segment Data:**
  a. Use the Gender and Income columns to segment sales performance.
  b. Calculate the Average Revenue per Customer for each segment.

Level 4: Exploratory Data Analysis (EDA)

Objective: Perform deeper analysis to uncover trends, outliers, and key insights.
Dataset: Use the combined dataset from all ad channels and sales_data.csv.
Tasks:

- **Customer Segmentation:**
  a. Segment customers by Age group (e.g., 18-25, 26-35, etc.) and analyze average spending.
  b. Identify which age group spends the most and show the distribution.
- **Correlation Analysis:**
  a. Find the correlation between Annual Income and Total Revenue for each customer.
  b. Identify trends in Customer Spend across different Cities or States.
- **Time-Series Analysis:**
  a. Plot sales data to visualize trends over time (e.g., monthly sales trend, promotion periods).
  b. Perform a rolling average for daily or weekly sales to identify seasonality.
- **Ad Channel Performance:**
  a. Analyze the effectiveness of each ad channel by looking at the CTR (Click-Through Rate) and CPC (Cost per Click) from the instagram_ads.csv, facebook_ads.csv, etc.
  b. Create a summary of Cost per Acquisition (CPA) for each ad channel.

Level 5: Customer Lifetime Value (LTV) Analysis

Objective: Calculate and interpret the Customer Lifetime Value (LTV).
Dataset: Use the customer_master.csv and sales_data.csv.
Tasks:

- **Calculate LTV for each customer based on the formula:**
  LTV = (Average Purchase Value) × (Average Purchase Frequency) × (Customer Lifetime)
  Calculate these metrics per channel (e.g., Instagram, Facebook, etc.).
- **Compare LTV by Acquisition Channel:**
  a. Segment customers by acquisition channel (e.g., Instagram, Facebook) and calculate their average LTV.
  b. Identify which channel yields the highest LTV and discuss the potential reasons.
- **Analyze Retention:**
  a. Determine the Average Customer Lifetime for each ad channel based on the data provided.
  b. Segment customers by their purchase frequency and calculate the churn rate.

Level 6: Dashboard Project

Objective: Build a dynamic dashboard for marketing and sales performance.
Dataset: Combine Sales Data with Ad Channel Performance data.
Tasks:

- **KPI Overview:**
  - Total Revenue, Total Orders, Total Ad Spend, CTR, CPA, LTV
  - Use pivot tables to calculate key metrics and display them dynamically in a dashboard layout.
- **Visualize Data:**
  - Use Pivot Charts to visualize sales trends, ad channel performance, and customer segmentation.
  - Create a Funnel Chart to analyze conversion rates from viewing ads to making a purchase.
- **Dynamic Filters:**
  - Add Slicers for region, age group, or ad channel to allow dynamic filtering.
  - Use drop-down lists for users to select different metrics (e.g., total sales, CTR, CPA).
- **Dashboard Design:**
  - Ensure the layout is clean and visually appealing, with a mix of charts, KPIs, and tables.
  - Focus on interactivity and ease of use.

✅ **Bonus Challenge: Predictive Simulation**

- **What-If Analysis:**
- a. Use Excel's Goal Seek or Data Tables to predict the effect of a 10% increase in Instagram ad spend on conversions and overall revenue.
- **Cross-Sell Analysis:**
- a. Calculate the cross-sell ratio to determine if customers are purchasing items from multiple categories.

📦 **Assignment Deliverables:**

- **Excel Workbook with:**
  - Raw data (Customer, Sales, Ad channels)
  - Pivot tables, charts, and analysis
  - Interactive dashboard
- **Report (optional) summarizing key insights, including:**
  - LTV analysis
  - Marketing channel performance
  - Key findings from EDA