**Retail Store Data Analysis Project**

**Objective:**

To analyze and visualize a dataset representative of a retail store to uncover insights into sales trends, customer behavior, and product performance, demonstrating competency in data analysis, SQL querying, and visualization techniques using Excel, SQL, and Power BI.

**Dataset Overview:**

* Transaction ID
* Date
* Customer ID
* Gender
* Age
* Product Type (e.g., beauty, clothing, electronics)
* Quantity
* Price per unit
* Total Amount

**Key Questions to Address:**

1. **Sales Analysis:**
   * What is the total revenue by month/year?
   * What are the daily sales trends over a given period?
   * Which product type generates the most revenue?
2. **Customer Behavior Analysis:**
   * What's the distribution of customers by gender and age group?
   * Which age group spends the most?
   * How does purchase behavior differ between genders?
3. **Product Analysis:**
   * What's the average price point for each product type?
   * Which products have the highest sales volume?
   * How do sales trends differ by product type?
4. **Transaction Analysis:**
   * What's the average basket size (in terms of quantity and amount)?
   * Are there any noticeable patterns, such as specific product combinations frequently bought together?

**Steps for Analysis:**

1. **Data Cleaning and Preparation in Excel:**
   * Handle missing values.
   * Remove any duplicates.
   * Convert data types if necessary (e.g., ensuring 'Date' is in a datetime format).
2. **Data Querying using SQL:**
   * Extract specific data subsets for analysis.
   * Perform aggregations, like summing up total sales by product type or calculating average basket size.
   * Join or merge relevant tables if the dataset is spread across multiple tables.
3. **Exploratory Data Analysis (EDA) in Excel:**
   * Get summary statistics for quantitative variables.
   * Visualize distributions of key variables using basic Excel charting tools.
4. **Data Visualization in Power BI:**
   * Time series plot for sales trends over time.
   * Bar charts for sales by product type, age group, and gender.
   * Pie charts for distribution of transactions by product type.
   * Scatter plots for relationships (e.g., age vs. total amount spent).
   * Create interactive dashboards that allow users to filter and drill down into specific areas of interest.
5. **Advanced Analysis (optional):**
   * Customer segmentation using clustering techniques in Power BI.
   * Association rule mining in Power BI to discover product combinations that frequently occur together.
6. **Conclusions and Recommendations:**
   * Summarize key findings.
   * Offer actionable recommendations for the store, such as potential marketing strategies, inventory suggestions, etc.

**Documentation:**

1. **Project Report:**
   * **Introduction:** Briefly describe the dataset and objectives.
   * **Methods:** Outline the tools (Excel, SQL, Power BI) and techniques used.
   * **Results:** Present your findings with supporting visuals from Power BI.
   * **Discussion:** Delve into the implications of your findings.
   * **Recommendations:** Offer actionable insights based on results.
   * **Conclusion:** Wrap up the project.
2. **Project Presentation (Slide Deck in Power BI):**
   * Summarize your project report into an interactive Power BI presentation.
   * Use visuals effectively to convey key points.
   * Ensure it's engaging and accessible to a non-technical audience.
3. **Code & Query Documentation:**
   * Document your SQL queries, explaining their purpose and structure.
   * Use comments generously if you use any scripting or advanced formulas in Excel.
   * In Power BI, maintain a clean and organized data model, and annotate any complex measures or calculations.