Executive Summary-Customer Shopping Behavior Analysis

Customer Shopping Behavior Analysis is a portfolio data analytics project aimed at understanding customer purchasing patterns and translating raw transactional data into actionable business insights. The analysis was conducted on a dataset containing 3,900 customer purchase records across multiple product categories, capturing demographic details, purchase behavior, discounts, subscriptions, reviews, and shipping preferences.

Problem Statement:

Businesses often collect large volumes of transactional data but struggle to convert it into insights that support strategic decisions such as improving customer retention, optimizing discounts, increasing subscriptions, and enhancing product positioning. This project addresses the challenge of identifying **who the most valuable customers are, what drives their spending behavior, and how businesses can tailor strategies to maximize revenue and customer lifetime value**.

Approach & Methodology:

The project followed an end-to-end data analytics workflow. Data cleaning and exploratory analysis were performed in **Python**, where missing values were handled, columns standardized, and new features such as customer age groups and purchase frequency indicators were engineered. The cleaned dataset was then integrated into **MySQL Workbench**, enabling structured SQL-based analysis to answer key business questions related to revenue distribution, customer segmentation, discount dependency, and subscription behavior. Finally, insights were visualized through an interactive **Power BI dashboard**, allowing dynamic exploration of trends and patterns.

Tools & Technologies Used

- **Python** (Pandas, NumPy) for data cleaning, EDA, and feature engineering
- **MySQL Workbench** for SQL-based business analysis
- **Power BI** for interactive dashboard creation and data visualization

Key Outcomes

The analysis revealed meaningful differences in spending behavior across demographics, shipping preferences, and subscription status. Customer segmentation highlighted distinct patterns between new, returning, and loyal customers, while product-level analysis identified top-performing and discount-dependent items. These insights directly informed strategic recommendations around subscription growth, loyalty programs, discount optimization, and targeted marketing.

Business Impact

This project demonstrates how data-driven analysis can support **smarter marketing strategies, improved customer retention, and better revenue optimization**. It showcases practical skills in Python, SQL, and Power BI while reflecting a real-world analytics use case suitable for business and stakeholder decision-making.