

E-Commerce Return Rate Analysis

1. **Introduction:** This project, E-commerce Return Rate Reduction Analysis, aims to systematically identify the underlying reasons behind customer returns and analyse how return rates vary across product categories, suppliers, geographies, and marketing channels. By leveraging data-driven insights and predictive analytics, the project seeks to proactively reduce return rates through better product, marketing, and operational strategies.
2. **Abstract:** Product returns are a major operational and financial challenge for e-commerce businesses, affecting profitability, customer experience, and supply chain efficiency. This project focuses on analysing the key drivers behind customer returns and predicting return risks to support proactive decision-making.
3. **Tools Used:**
 - **Python:** Data Exploration, Data Management, Feature Engineering, Logistic Regression Modelling.
 - **SQL:** Data Exploration and Preparation.
 - **Power BI:** Interactive Dashboard.
4. **Data Preparation:**
 - Importing the dataset into SQL or python.
 - Quick inspection of data using head() and tail() in python.
 - Handling the missing values.
 - Changed the data type of columns
5. **Exploratory Data Analysis (EDA):**
 - Categories like Home Appliances and Footwear have high rate of returns.
 - Females are the customers has high rates of return.
6. **Predictive Modelling:**
 - Logistic Regression Model:
 - Objective: Predict whether a product will be returned.
7. **Power BI Dashboard:**
 - Created an interactive return risk analysis dashboard.
 - **Filters:**
 - Category
 - Customer Location
 - Marketing Channel
 - **Visuals:**
 - Return Rates by category, supplier, marketing channel.
8. **Deliverables:**
 - Data Cleaning scripts.
 - Logistic Regression model training.
 - High-Risk Products CSV:
 - List of products with predicted return probabilities.
9. **Insights:**
 - Improve quality checks for suppliers with >20% return rate.
 - Reduce the discount strategies to avoid the excessive impulse buying.

- Increase the shipping options especially in high return areas.
- Based on the customer age group and seasonality change the marketing ideas.
- Innovate new marketing ideas in the areas that has high return rates more to increase the revenue of the company.

10. Dashboard:



