**CUSTOMER INSIGHTS AND SEGMENTATION DASHBOARD PROJECT**

# 1. Introduction

This project focused on analyzing a UK-based online retail dataset to uncover key customer behavior patterns. Through exploratory data analysis (EDA) and RFM (Recency, Frequency, Monetary) segmentation, the goal was to generate actionable business insights that can help improve customer engagement, retention, and revenue growth. The final output is an interactive Power BI dashboard for intuitive data exploration by stakeholders.

# 2. Exploratory Data Analysis (EDA)

Key patterns and trends were uncovered through various visualizations:

• Quantity Ordered Distribution: Right-skewed, most orders range from 1–5 units. Spikes at 6, 12, and 24 may indicate promotional packs or bulk purchases.

• Boxplot of Quantity Ordered (< 100):

Small-quantity orders dominate, but significant outliers suggest bulk purchases in certain cases.

• Unit Price Distribution (< £100):

Majority of items are extremely low-cost, mostly under £10, with a strong concentration around £1–2.

• Boxplot of Unit Prices (< £100):

Unit prices are tightly clustered around £2–£3, with notable outliers reaching £90+, indicating occasional premium items.

• Total Price Distribution:

Most purchases are low in value (£5–£20), though a few outliers push totals up to £200.

• Boxplot of Total Price:

While most orders are low in value (under £50), there are several high-value outliers exceeding £1000.

• Top 10 Countries by Transactions (Excl. UK):

Germany, France, and Ireland lead non-UK countries in transaction volume, highlighting regional customer diversity.

• Top 15 Countries by Transactions (Incl. UK):

The UK is the overwhelmingly dominant market, contributing over 350,000 transactions, far more than any other country.

• Scatterplot of Unit Price vs Quantity:

No strong relationship exists, most data points lie in the low-price, low-quantity region.

• Scatterplot of Unit Price vs Total Price:

A near-linear pattern emerges, with total price increasing predictably as unit price increases.

• Boxplot of Total Price per Order by Country:

Australia and Netherlands show high variability in order values, while UK orders are smaller but more frequent.

• Monthly Sales Trend:

Revenue peaks in November, likely due to holiday sales, after remaining steady in earlier months.

• Daily Revenue Trend:

Despite daily fluctuations, notable revenue spikes appear in Feb, Sep, and Dec, hinting at seasonal shopping behavior.

• Top 10 Products by Revenue:

High-value products are mostly gift/home decor items, with “PAPER CRAFT , LITTLE BIRDIE” leading by a large margin.

• Top 10 Countries by Revenue (Excl. UK):

Netherlands and Ireland generate high revenue despite fewer transactions, indicating larger average order values.

• Top 10 Customers by Revenue:

A small group of loyal customers contributes disproportionately high revenue, with the top customer alone exceeding £275,000.

# 3. RFM Analysis and Segmentation

RFM (Recency, Frequency, Monetary) analysis was performed to segment customers based on their buying behavior. The RFM scores were then used to group customers into segments like Champion, Loyal, At Risk, and Lost using logical rules and clustering.

# 4. Power BI Dashboard Summary

The interactive dashboard includes the following visualizations and KPIs:

* KPI Cards – The business serves 4,338 customers, generating £8.89M total revenue, with an average order value of £479.56, 18.53K total orders, and £11.57K revenue per customer.
* Revenue Over Time – Revenue peaked in November (£1.25M), showing strong growth from September onwards.
* Revenue Contribution by Segment – Champion customers contribute the most revenue at £5.9M, followed by Loyal Customers (£1.4M) and Potential Loyalists (£0.9M).
* Customer Distribution by Segment – Largest segments are Champions (26.26%) and Potential Loyalists (23.26%), while At Risk customers form only 7.15%.
* Geographic Revenue Distribution – Majority of revenue originates from Europe, with dense customer presence compared to other continents.
* Top 10 Customers by Revenue – Top customer (ID 14646) generates £280,206, and the top 10 together contribute £1.54M, 17% of total revenue.

# 5. Key Business Insights

• High-revenue months are November and December, likely due to holidays.  
• Champion and Loyal customers make up the bulk of revenue – retention programs could be valuable.  
• Several countries outside the UK (e.g. Ireland, Germany, Netherlands) show high revenue potential.  
• There is a difference between high-volume vs. high-value products, each needs a tailored strategy.

# 6. Conclusion and Recommendations

This project successfully used EDA and RFM segmentation to uncover valuable insights into customer purchasing behavior. The Power BI dashboard enables interactive exploration of customer segments and revenue trends

Recommendations:  
• Launch loyalty campaigns targeting 'Loyal' and 'Potential Loyalist' customers.  
• Increase marketing in top-performing international regions.  
• Manage stock and promotions strategically during high-demand months (Nov–Dec).  
• Re-evaluate pricing and bundling strategies for low-unit-price, high-volume products.