# Data Analysis Project Report

* **Project Title:** Customer Segmentation Analysis for Retail Sales
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### 1. Abstract

This project aims to perform a comprehensive exploratory data analysis on a retail sales dataset. The primary goal is to identify key sales trends, analyze customer behavior, and create a dynamic dashboard for stakeholders. The analysis was conducted using Microsoft Excel, leveraging its powerful functions for data cleaning, transformation, and visualization. The final outcome is a clear, interactive dashboard that provides actionable insights to improve sales strategies and inventory management.

### 2. Objectives

* Clean and prepare the raw dataset for analysis(if needed).
* Formulate and answer five key questions based on the dataset.
* Create a comprehensive, user-friendly dashboard that visualizes key metrics.
* Use appropriate charts and graphs to effectively communicate insights.
* Summarize the findings and their business implications in a clear and concise manner.

### 3. Scope of the Project

* Focused on data cleaning, analysis, and visualization only.
* No programming languages (like Python or R) or advanced statistical modeling used.
* All work is contained within a single Excel file.
* Analysis is limited to the provided dataset.

### 4. Tools & Technologies Used

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| --- | --- |
| **Tool/Technology** | **Purpose** |
| Microsoft Excel | Data manipulation, analysis, and dashboard creation |
| PivotTables | Summarizing data for analysis |
| Charts & Graphs | Data visualization |

### 5. Data Cleaning & Preparation

Already clean.

### 6. Dashboard Design Strategy

 **Layout:** KPIs at the top → charts in the middle → filters at the bottom.

 **KPIs:** Total Sales, Total Orders, Unique Customers, Avg. Orders/Customer.

 **Visuals:**

* Bar chart → Top 5 customers, product/category sales.
* Line chart → Sales trend over time.
* Pie chart → Customer/product share.
* Table → Detailed sales with conditional formatting.

 **Interactive :** Slicers/filters for date, customer, product, region.

 **Design:** Consistent colors, clear titles, minimal text, focus on insights.

### 7. Questions & Solutions

* **Q1. How many unique customers are in the dataset?**  
  **Solution:** There are **52 unique customers**.
* **Q2. What is the total number of orders placed?**  
  **Solution:** The total order quantity across all customers is **336 orders**.
* **Q3. What is the average order quantity per customer?**

**Solution:** On average, each customer placed about **6.46 orders**.

**Q4. Who are the top 5 customers by total order quantity?**

**Solution:**

1. **Grand Total** – 168 (aggregate, not an individual customer)
2. **Emily Brown** – 10 orders
3. **David Rodriguez** – 8 orders
4. **Michael Martinez** – 8 orders
5. **Jennifer Davis** – 8 orders

(If we exclude “Grand Total” row, **Emily Brown** is the top individual customer.)

* **Q5. Which customer placed the maximum single order (highest in one entry)?**

**Solution:** The **Grand Total row** shows 168, but for individual customers the max in a single entry is **Emily Brown with 10 orders**.

### 9. Challenges Faced & Solutions

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| --- | --- |
| **Challenge** | **Solution** |
| **Challenge 1:** e.g., Difficulty in handling missing values | **Solution:** e.g., Used the "find and replace" feature to fill in missing data points with "N/A" or "Unknown" |
| **Challenge 2:** e.g., Choosing the right chart type to visualize a specific trend | **Solution:** e.g., Experimented with different chart types (line, bar, pie) and settled on a line chart for clarity in showing the trend over time |
| **Challenge 3:** e.g., Data was not in a tidy format for PivotTables | **Solution:** e.g., Used the "Text to Columns" feature and rearranged data columns to create a clean table |

### 10. Outcome

* Summarize the key insights gained from the project.
* Discuss the usefulness of the dashboard.
* Reflect on the skills learned and enhanced during the process.

### 11. Screenshots of Final Output

### 12. Conclusion:

### This mini project helped me strengthen my data analysis skills using Microsoft Excel. I gained practical insights into data cleaning, transformation, and creating effective visualizations to communicate findings. The hands on analysis of a real world dataset also enhanced my understanding of how data can be used to solve business problems and make informed decisions.