Retail Demand Forecasting - Capstone Project

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Contents

1 Project Introduction and Objective

This project was developed as part of the Google Data Analytics Capstone and focuses on analyzing product demand in the retail sector.

1.1 Project Resources

- **Live Dashboard:**
  Tableau Dashboard
- **Full Report:**
  GitHub Portfolio Report
- **Code:**
  GitHub Repository
- **Dataset:**
  Kaggle Dataset

Objective: Analyze historical order data to identify trends, seasonality, and provide strategic insights for forecasting future demand.

2 Data Loading and Cleaning

The dataset is first loaded and cleaned. Here's a summary of the key steps:

Renamed columns to lowercase and replaced spaces with underscores.

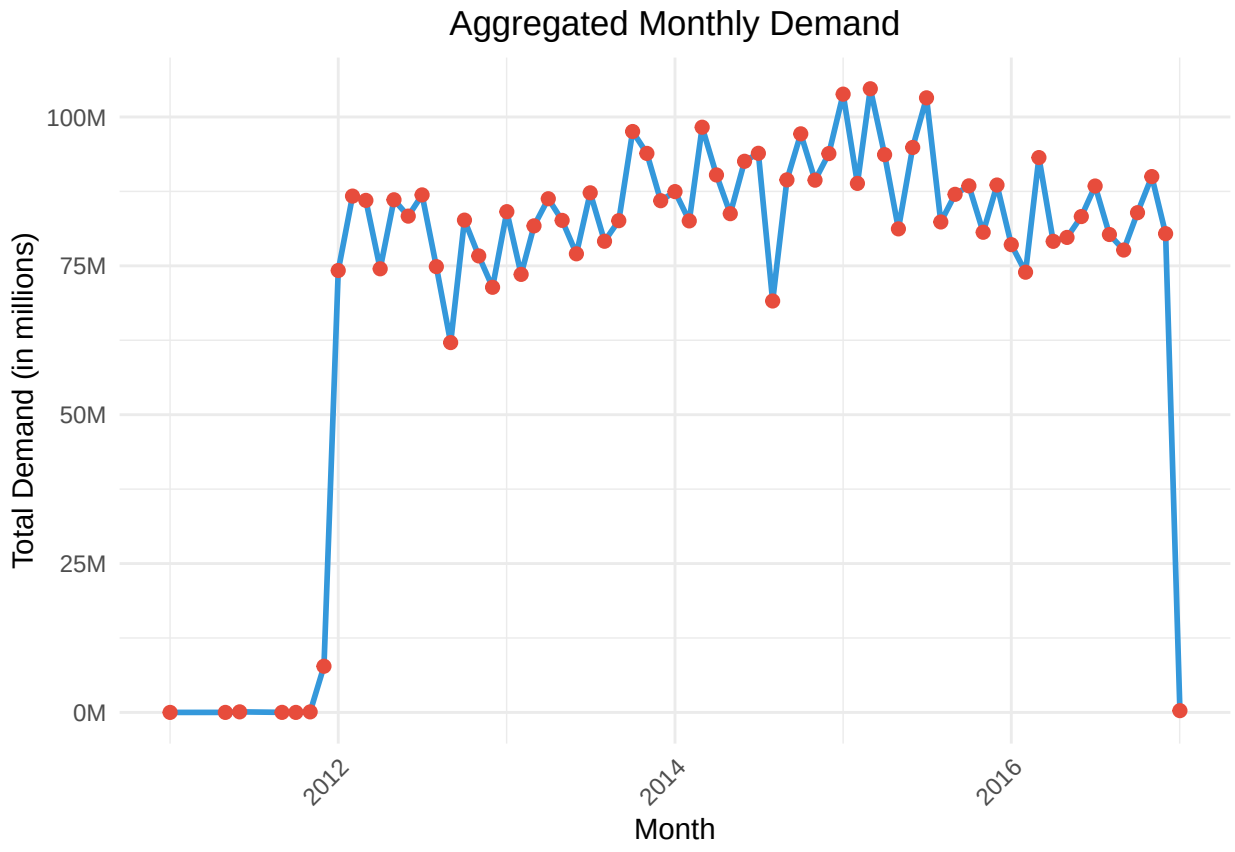
Converted order_demand to numeric, handling negative values.

Removed rows with missing values.

Created a month column to aggregate data.

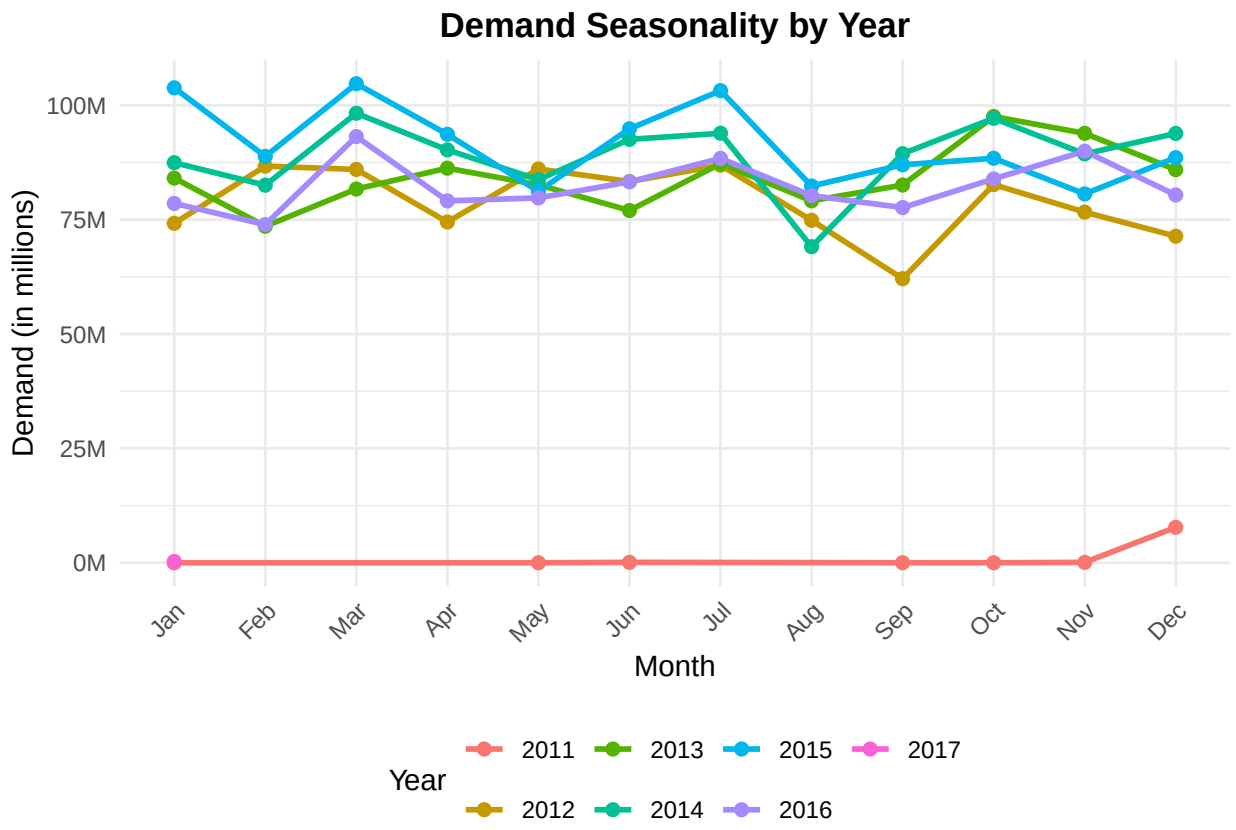
3 Analysis 1: Aggregated Monthly Demand

This chart shows how total demand has evolved over time on a monthly basis.



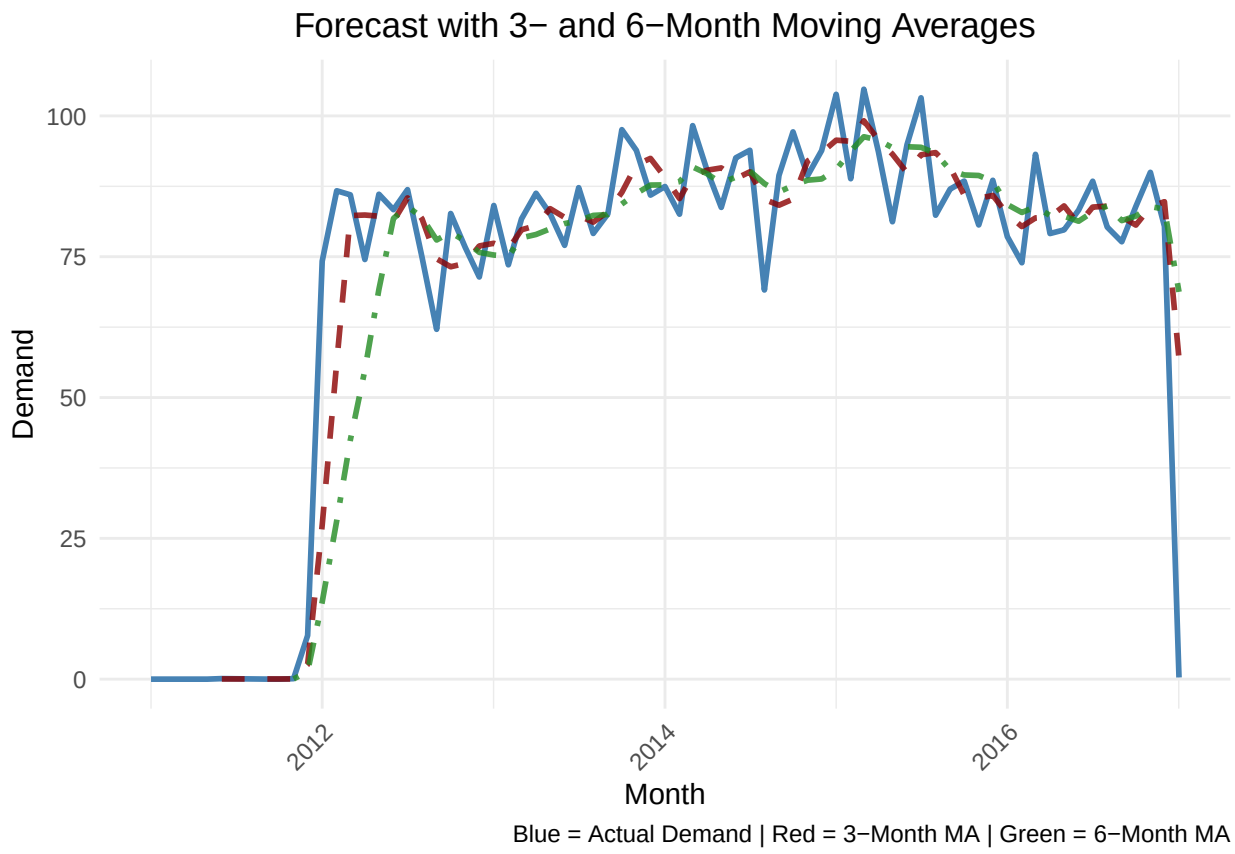
4 Analysis 2: Seasonality

Demand patterns are evaluated by month and year to identify recurring trends.



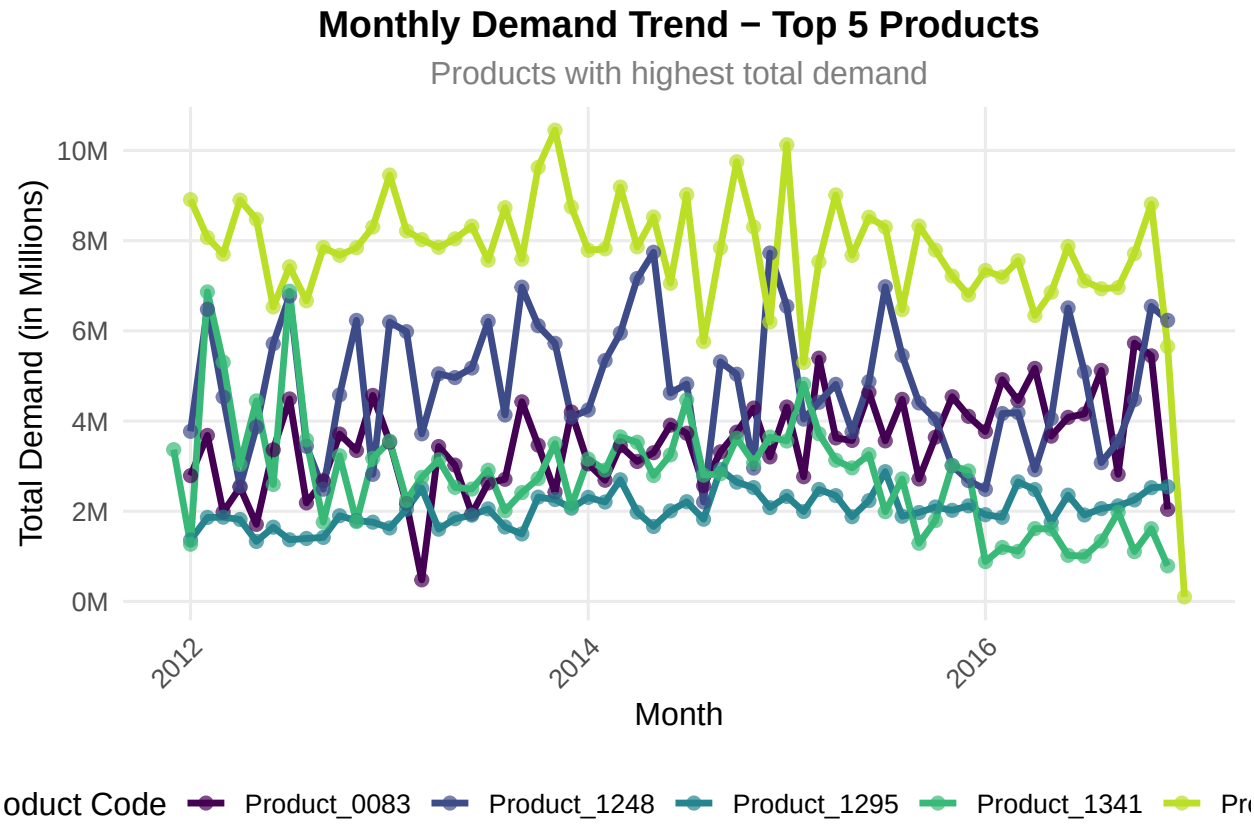
5 Analysis 3: 3-6 Months Moving Average Forecast

Applied a rolling average to smooth demand and help forecast future trends.



6 Analysis 4: Top 5 products

Filtered the top 5 products and visualized them with a line chart.



7 Analysis 5: Annual Demand by Warehouse and Product Category

This table shows the annual demand by warehouse and product category. (Only few row)

Table 1: Annual Demand by Warehouse and Product Category

Warehouse	Product Category	2013	2014	2015	2016	2011	2012	2017
Whse_A	Category_001	232	1,151	57	304	0	0	0
Whse_A	Category_003	21,168	21,744	32,148	33,741	108	22,266	0
Whse_A	Category_005	255,600	280,000	132,500	127,500	0	315,900	0
Whse_A	Category_006	2,151,230	2,082,483	2,277,526	1,943,283	21,504	3,009,885	0
Whse_A	Category_007	467,230	536,028	665,865	595,536	1,556	517,509	0
Whse_A	Category_008	386	338	385	771	0	21	0
Whse_A	Category_009	128,187	147,138	225,839	228,504	920	135,187	0
Whse_A	Category_010	3,436	2,016	1,902	2,120	0	2,483	0
Whse_A	Category_011	1,520	2,077	1,419	2,622	0	2,299	0
Whse_A	Category_012	680	671	863	6,515	0	17	0
Whse_A	Category_013	10,323	8,663	8,193	8,705	407	16,023	0

8 Data Export for Tableau

```r
write.csv(df, "data/Historical_Product_Demand_Tableau.csv", row.names = FALSE)
```