<u>Summary (Retail Analysis of Walmart Sales Data)</u>

Objective :- This project aimed to analyze Walmart sales data to uncover trends, forecast future demand, and generate actionable insights. Specifically, the project addresses:

1. Identifying the top-performing and underperforming stores.

2. Analyzing sales variability across stores.

3. Examining monthly and biannual sales trends.

4. Developing a predictive model for future sales.

Approach and Solution:

1. **Data Cleaning and Feature Engineering:**

   - The dataset was preprocessed to handle missing values, and new features such as the day, month, and year were extracted from the existing data field for time-based analysis.

2. **Exploratory Data Analysis (EDA):**

   - The sales data was visualized using graphs and charts to understand sales distribution across various stores.

   - Insights on holiday sales trends were drawn, comparing weeks with and without holidays to determine how holiday's influence store performance.

3. **Statistical Insights:**

   - Stores were ranked based on sales volume. The store with the highest and lowest sales was identified.

   - The store with the highest sales variability was determined by calculating the standard deviation and coefficient of variation.
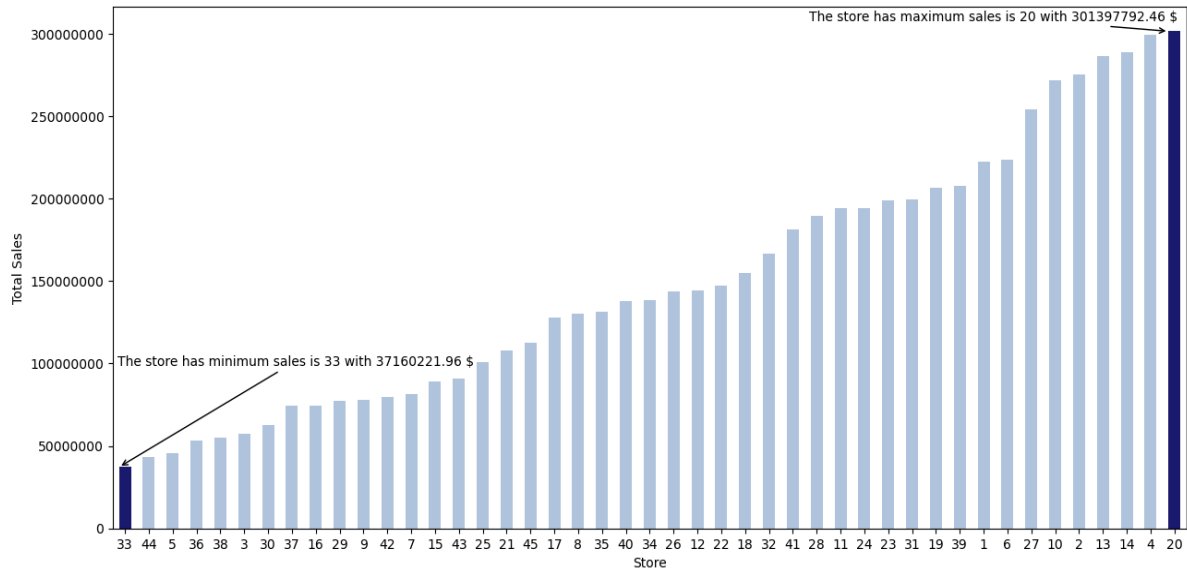
4. **Sales Trend Analysis:**

   - Sales were aggregated by month and semester to visualize and analyze trends. This analysis helped in identifying peak sales periods and seasonality patterns.
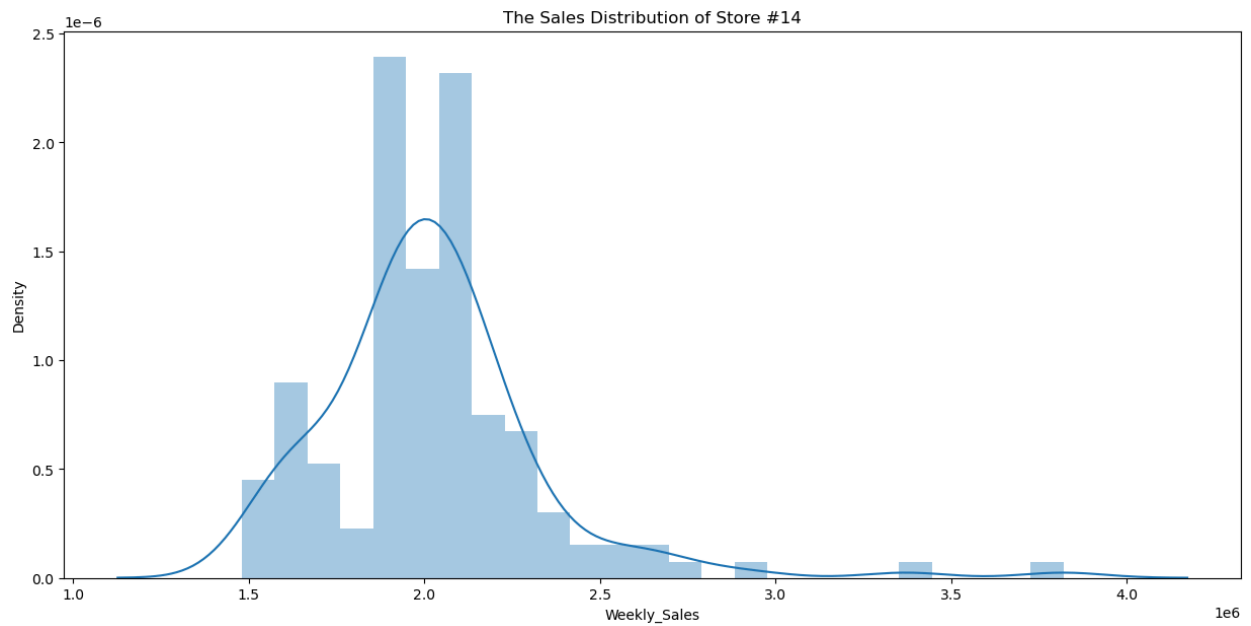
5. **Sales Prediction:**

   - A forecasting model was developed using the time-series data to predict future sales. This model was trained on historical data to help forecast demand and make data-driven decisions.

Conclusion: Through this comprehensive analysis, Walmart can identify which stores require strategic intervention to improve sales performance, while also predicting future demand. The project helps in optimizing resource allocation and better understanding consumer behavior across different periods.
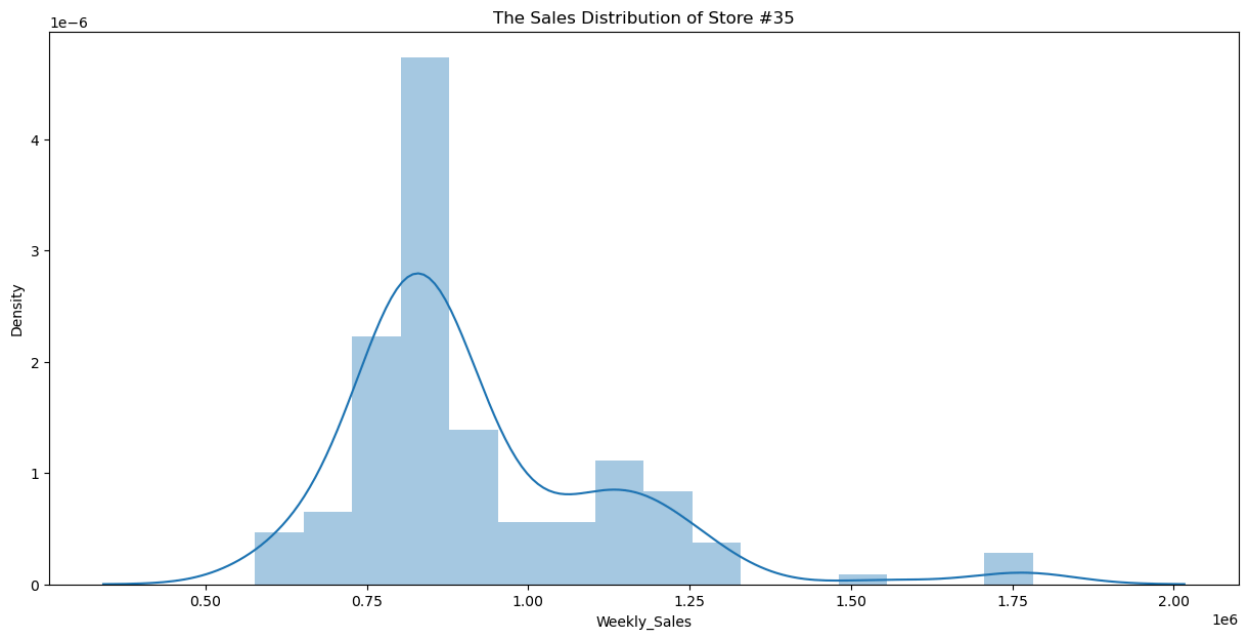
# Visualization of Walmart Data

The store has maximum sales is 20 with 301397792.46 $

The store has minimum sales is 33 with 37160221.96 $

1. Stores with Maximum and Minimum Sales

The Sales Distribution of Store #14

2. Distribution of Stores that has Maximum Standard Deviation
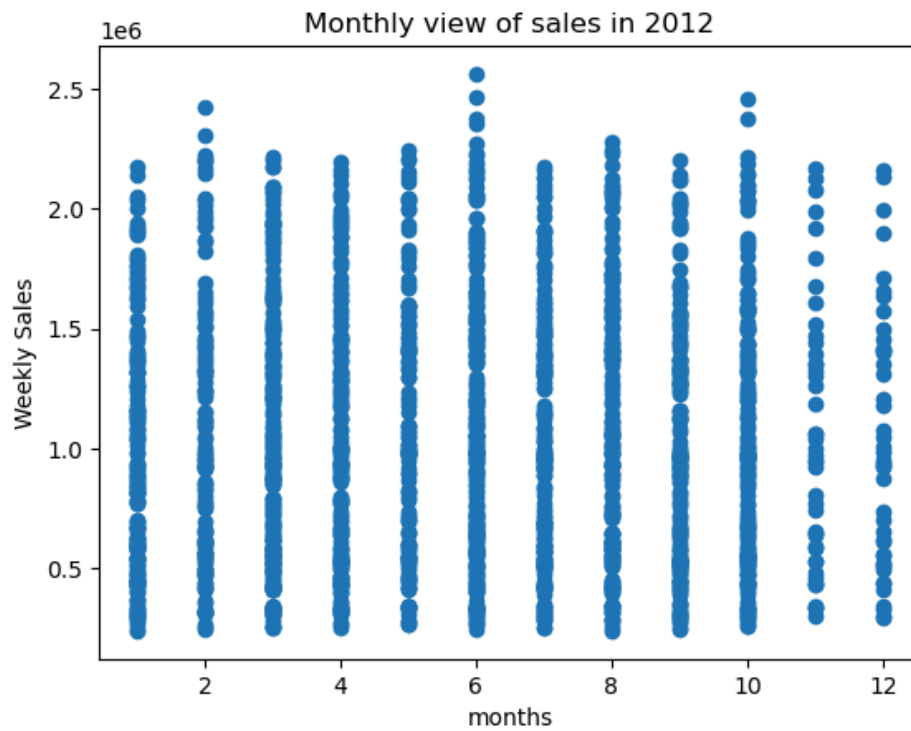
The Sales Distribution of Store #35

3. Distribution of store has maximum coefficient of mean to standard deviation

Monthly view of sales in 2010
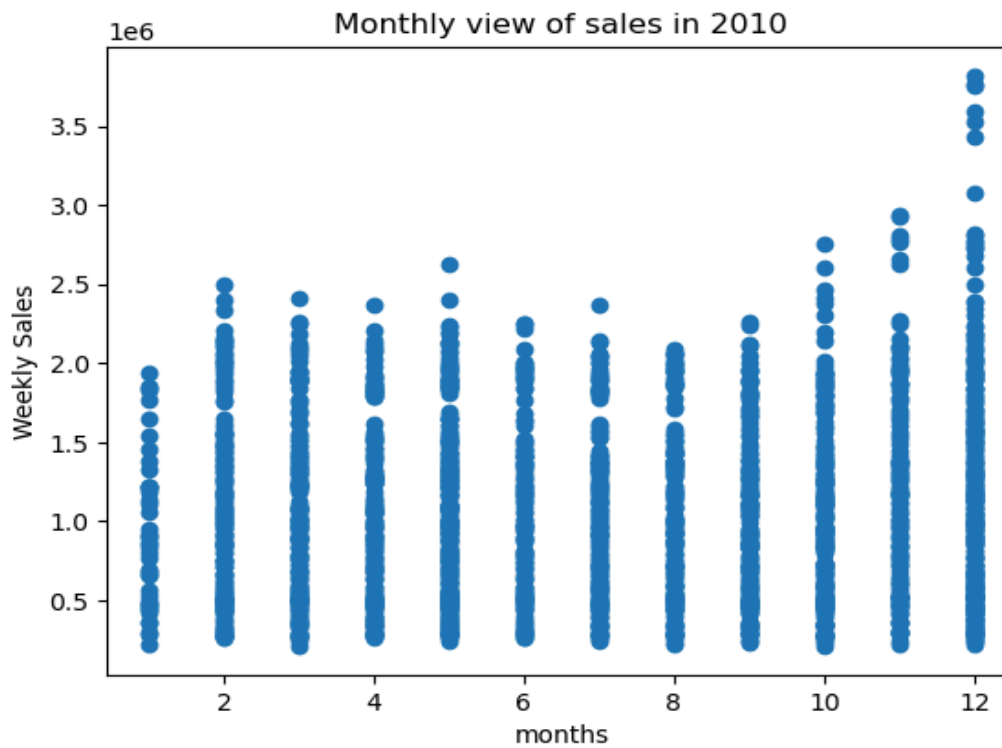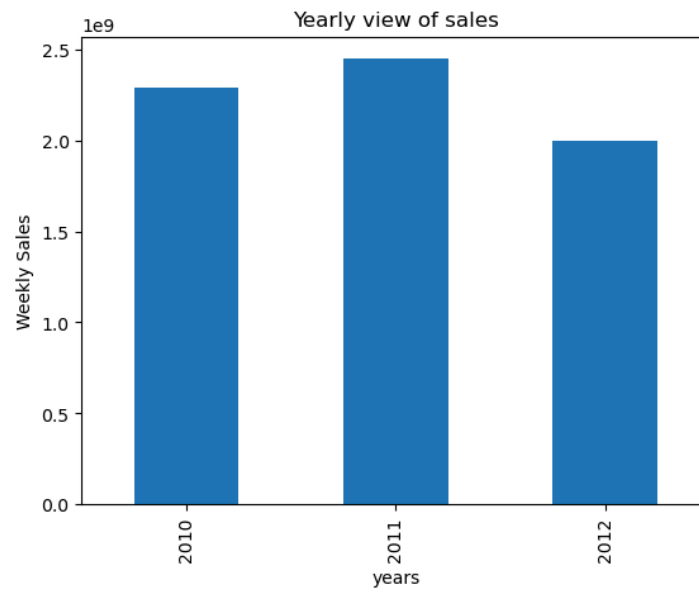
4. Monthly View of Sales in 2010
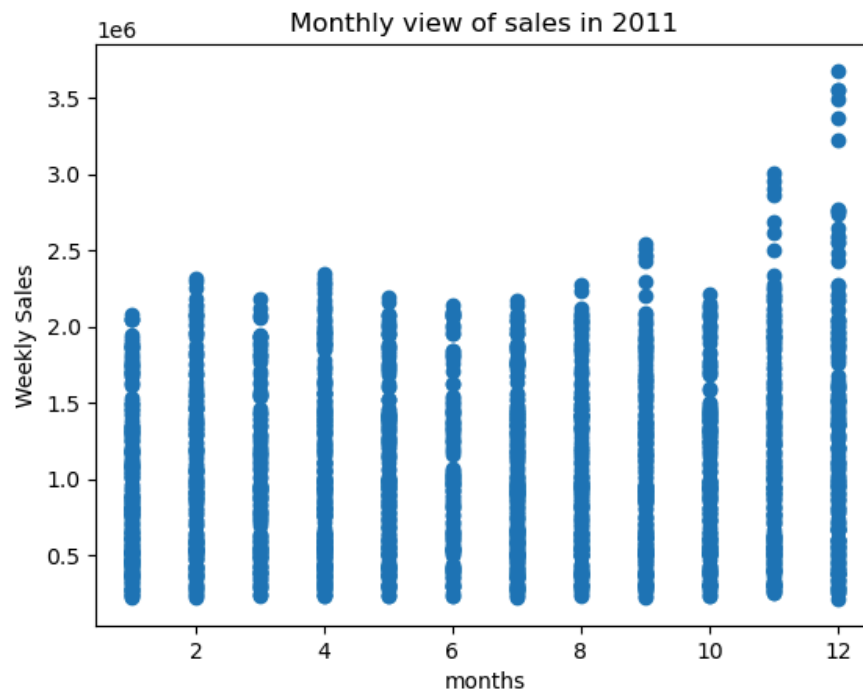
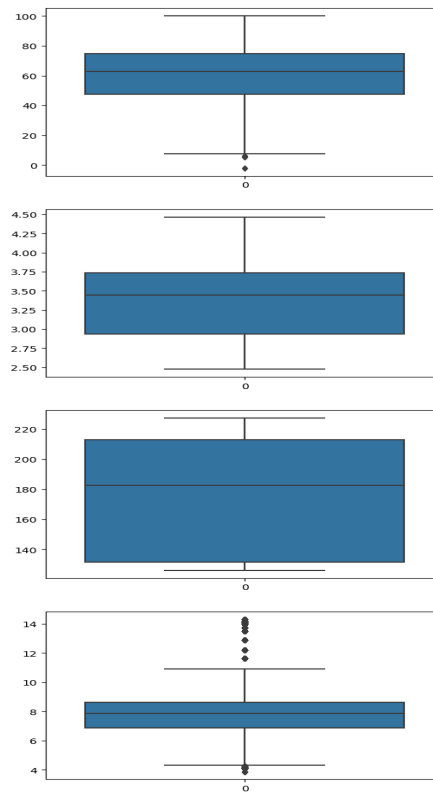**5. Monthly View of Sales in 2011**

6. Monthly View Sales in 2012

Yearly view of sales

7. Yearly View of Sales

8. Prediction Models to Forecast Demand