1. **Data Preparation**
   - There is no much thing to do for data cleaning since the dataset is clean, except Date column.
   - The dataset is imported to PowerBI to process data cleaning step before performing analysis and creating dashboard.
2. **Product Performance Analysis**
     a. **Analyse the average weekly sales by store and holiday flag**
   - Top 10 stores with the highest average weekly sales for each year are chosen to analyze.
   - As we can see from the line chart, those months including February, November and December demonstrate highest average weekly sales.
   - All 10 stores share the same pattern of increasing sales starting from October to November and December, except year 2012 since data is not available for November and December 2012.
   - Compared to the below list of Holiday Events, we can see that the holiday seasons have some effect on sales since those months record higher sales for all 10 analyzed stores.
   - When there is no holiday (holiday flag = 0), the highest sales are shown in April, May and June.

Holiday Events: Super Bowl: 12-Feb-2010, 11-Feb-2011, 10-Feb-2012 \ Labour Day: 10-Sep-2010, 9-Sep-2011, 7-Sep-2012\ Thanksgiving: 26-Nov-2010, 25-Nov-2011, 23-Nov-2012\ Christmas: 31-Dec-1200, 30-Dec-2011, 28-Dec-2012
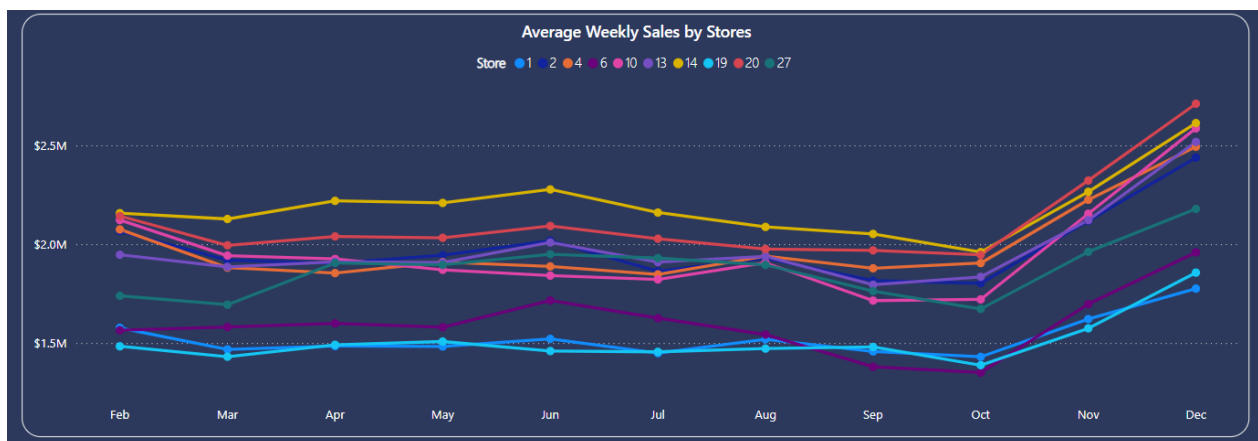

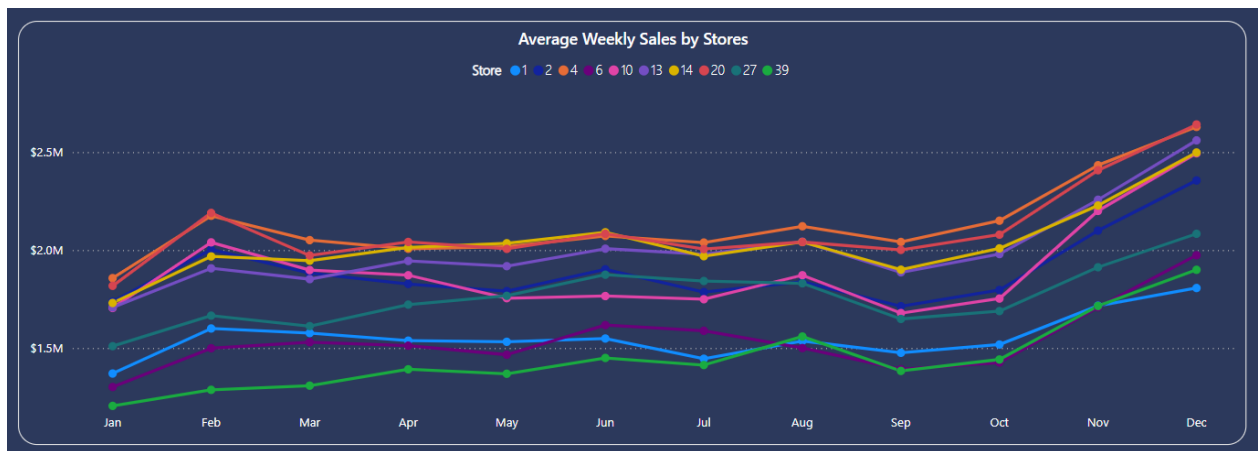**Figure 1. The average weekly sales by store and holiday flag in 2010**

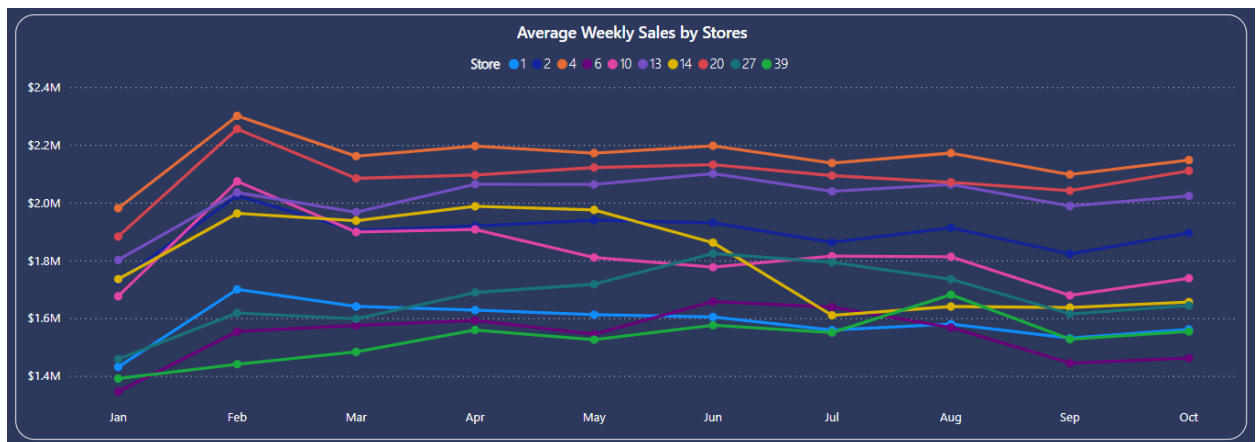**Figure 2. The average weekly sales by store and holiday flag in 2011**

Figure 3. The average weekly sales by store and holiday flag in 2012

b. Analyse the trend of weekly sales over time for a single store

- Store 20 is chosen to analyze.
- Over 3 years (2010, 2011, 2012), the same trend is shown as below:
    - When the holiday flag is on 1, there seems to be a distinct increase of sales in February, November and December. The year 2012 does not have data for November and December, therefore, increase in sales of February only is demonstrated.
    - When there is no holiday (holiday flag = 0), the highest sales are shown in April, May and June.
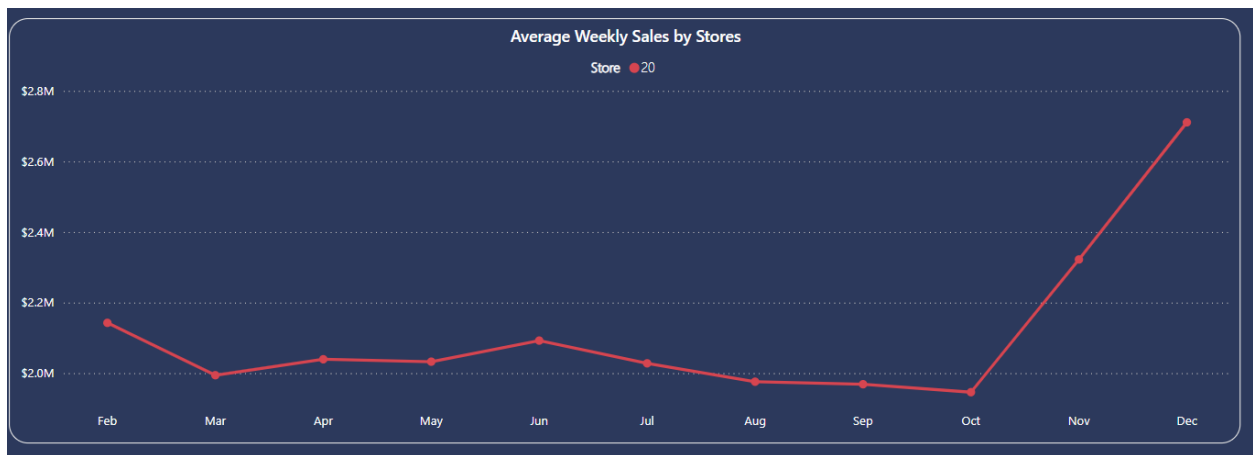
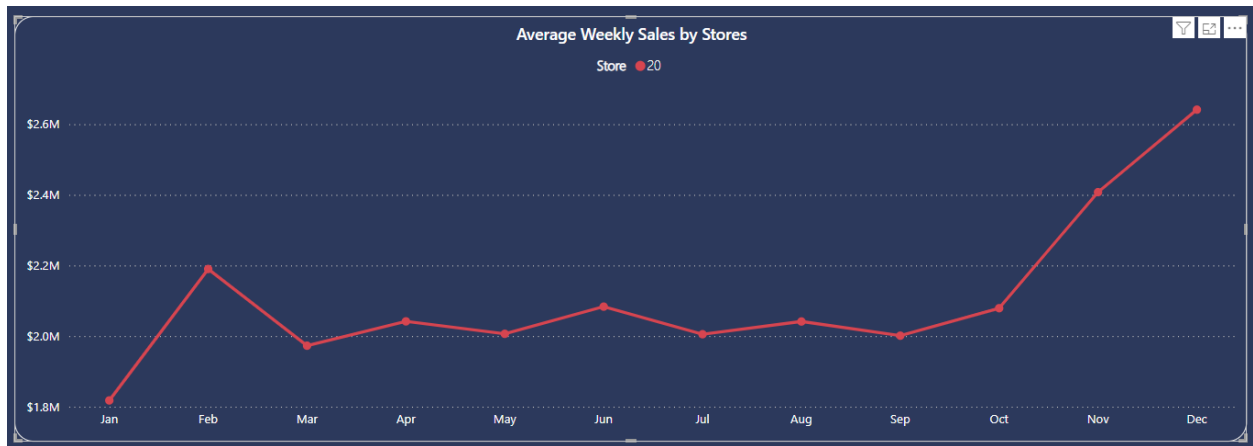**Figure 4. The trend of weekly sales (store 20) over time in 2010**

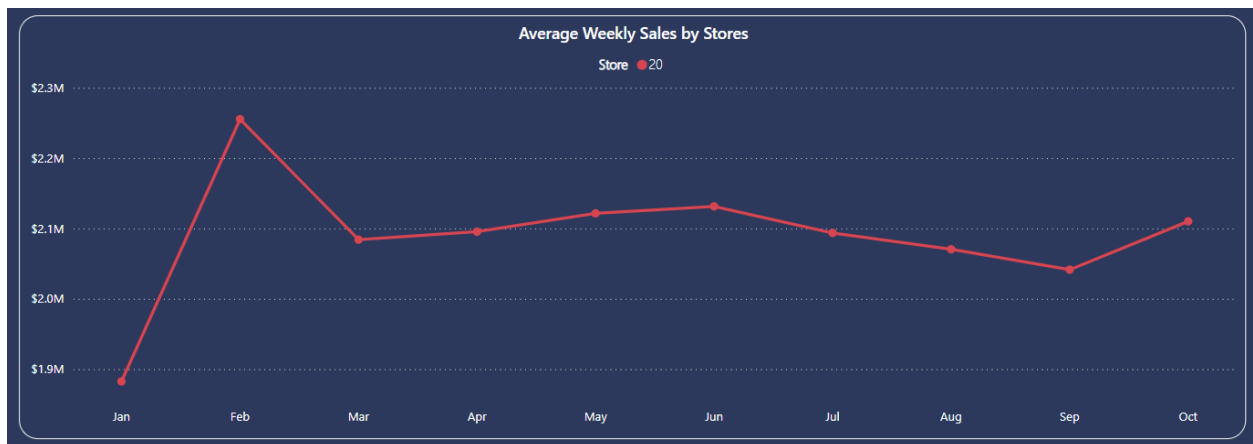**Figure 5. The trend of weekly sales (store 20) over time in 2011**

Figure 6. The trend of weekly sales (store 20) over time in 2012

3. Sales Trends Analysis

- **Analyse basic sales trends over a short time period (e.g., one month)**
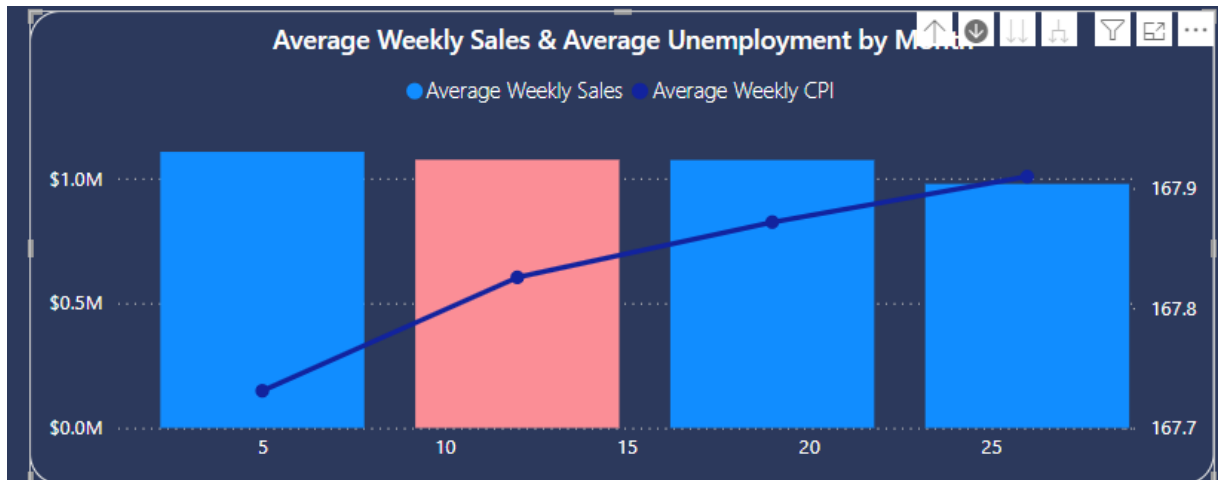 - Sales in February through 3 years 2010, 2011 and 2012 are being analyzed.

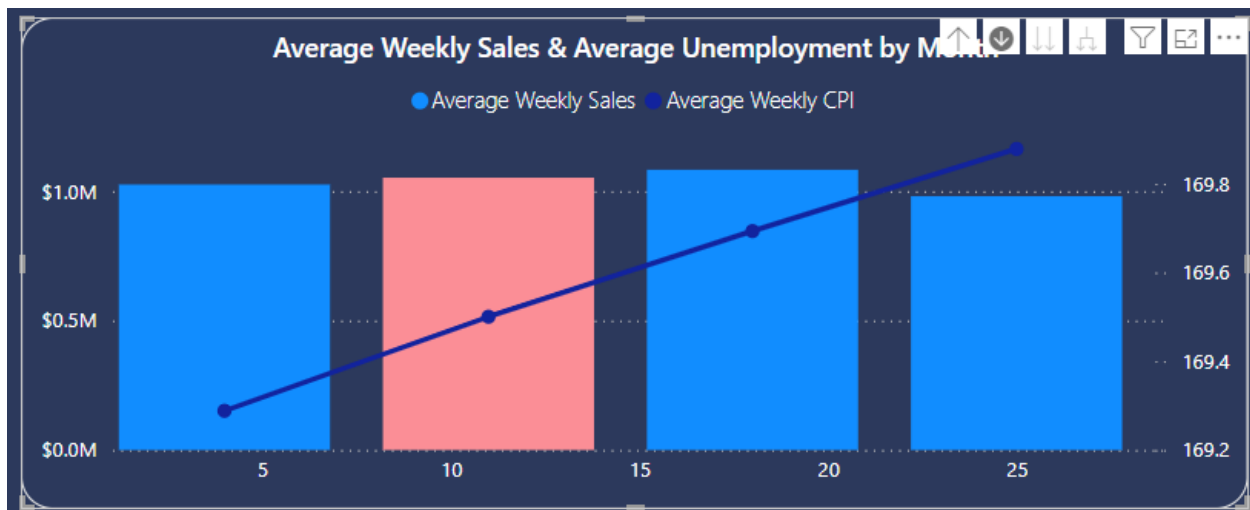**Figure 7. Average Weekly Sales in December 2010**

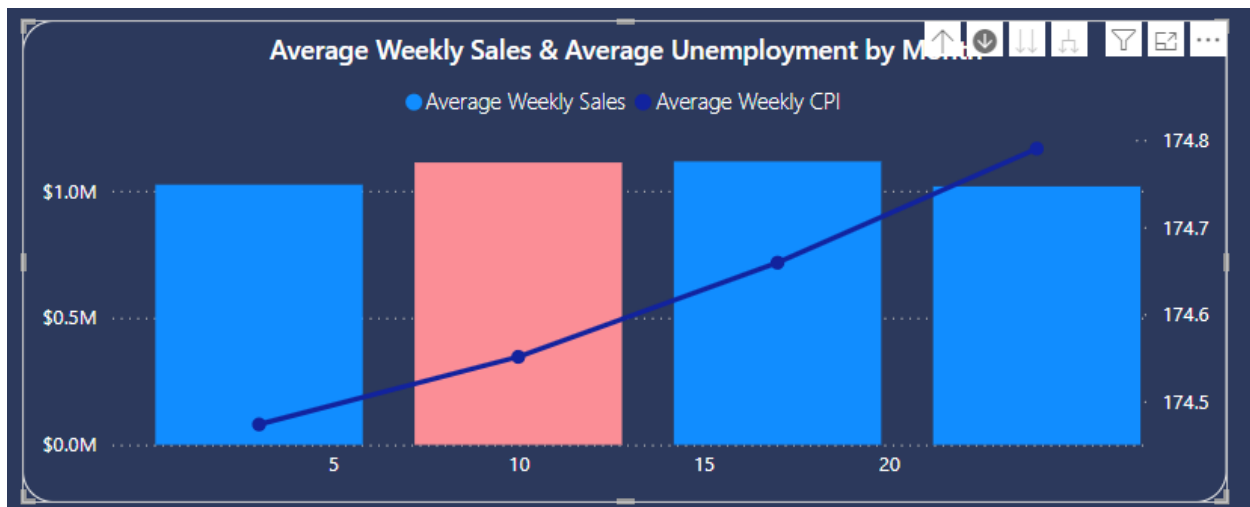**Figure 8. Average Weekly Sales in December 2011**

Figure 9. Average Weekly Sales in December 2012

- o As can be seen from the Figure 7, 8 and 9, there is an increase in sales throughout February.
- o For example in 2012, starting 10 February (as holiday), sales increased continuously.

- **Create a line chart to visualise and identify the seasonality or sales trends and highlight any noticeable patterns.**
  - o As analyzed above (2a), all 10 stores share the same seasonality or sales trends with a surge in sales records in February (2010, 2011 and 2012) and in November and December (2010 and 2011). For these months, holiday flag is on 1.
  - o When there is no holiday (holiday flag is on 0), highest sales were recorded in 3 months as April, May and June each year.

4. **Dashboard Development**
   a. **Provide a comprehensive overview of Walmart's sales performance.**
      - As can be seen from Figure 10, for 3 years, sales from holiday season (4 months as February, September, November and December in 2010 and 2011, 2 months as February and September in 2012) are accounted for more than 50% of sales for the whole year. For example, in 2010, sales for holiday is accounted for 51.33% of sales for the entire year ($1.11M)
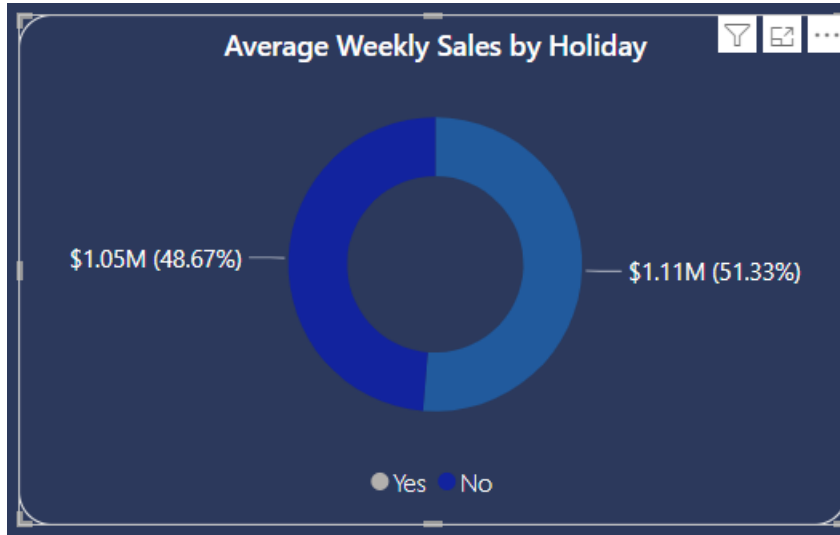

Figure 10. Average Weekly Sales by Holiday in 2010

      - In terms of Average Weekly sales by year, there is a decrease of 1.63% ($1.05M) in 2011 (compared to 2010) and of 0.67% ($1.04M) in 2012 (compared to 2010).
   b. **Some possible reasons for the decrease in sales in 2011 and 2012 compared to previous years**
      - Competition: increased competition from other retailers (both online and brick-and-mortar) can affect Walmart's market share and sales.
      - Consumer behavior: growing preferences for online shopping could affect Walmart's sales.
      - Pricing strategy: changing in pricing and promotion strategy might affect Walmart's sales.