Objective:

This project aims to explore the Walmart Sales data to understand top performing branches and products, sales trend of different products, customer behaviour. The aims is to study how sales strategies can be improved and optimized. The dataset was obtained from the [Kaggle Walmart Sales Forecasting Competition](https://www.kaggle.com/c/walmart-recruiting-store-sales-forecasting).

Findings:

1. We find that most of variables does not have strong correlation except year and fuel, Markdown1 and Markdown4.
2. There is a linear relationship between sales and markdown.
   1. Sales consistently increase for most part if the markdown is markdown4. The least effective is markdown1. Highly effective mark down is markdown3 which achieves max sale with least markdown
   2. This scatter plot illustrates the relationship between store size and total markdowns with each point scaled by average weekly sales. As we can see, larger stores tend to have more markdowns. One might assume this is due to larger stores having a wider variety of products and a higher sales volume which could lead to more promotional activities.
   3. Moreover, the size of the points represents the average weekly sales and it is noticeable that larger stores, which also have more markdowns, tend to have higher sales. This obviously suggests that markdowns are an effective strategy for boosting sales particularly in larger stores.
   4. What isn't obvious is that while one might expect larger stores to have better inventory management and thus fewer markdowns, the data suggests the opposite. This could lead to other interesting ideas for insights such as looking into the effectiveness of markdowns on sales across different store sizes.
3. Store type ‘A’ had significantly higher total sales than store types ‘B’ and ‘C’. This could be due to factors such as the number of stores, store size, location, and customer preferences.
4. From the correlation matrix we also saw that Store size had a positive correlation with weekly sales indicating that larger stores tend to have higher sales. We can find that the sales of medium size stores are higher in some cases and in most sales is similar in large and medium size stores. Sales in smaller store is lower compared to medium and large stores
5. It seems temperature and Unemployment does not have much effect on the sales. There doesn’t seem to be a clear relationship between the unemployment rate or temperature and weekly sales. This might suggest that sales are not heavily influenced by the unemployment rate or temperature.
6. Also, it seems the sales is not getting affected whether it is a holiday or not - except in one dept where the sales are high during holiday.
7. Sales Performance by Department: Some departments (like department 92, 95, 38, etc.) are significantly outperforming others in terms of average weekly sales. This suggests that these departments might be carrying the most popular or profitable items.