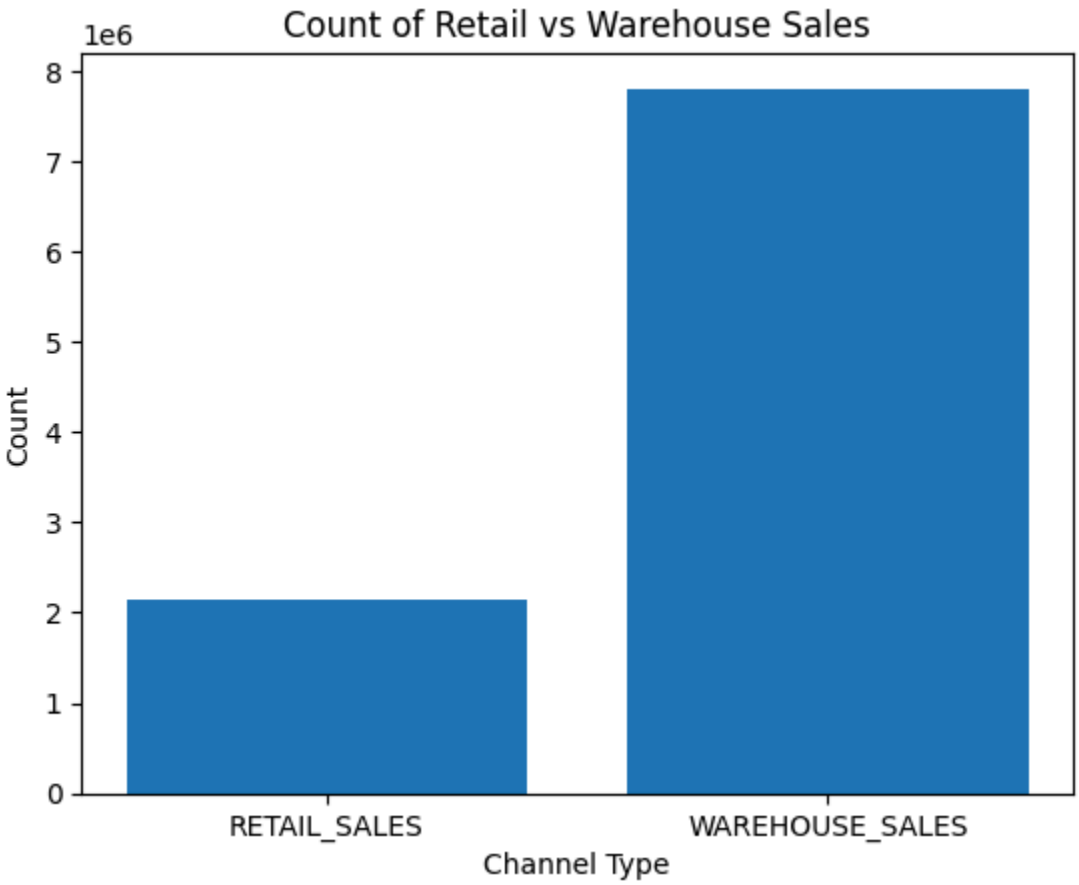
ISM 370
Jalyn Buthman

Final Business Analytics Project

The data in the Warehouse and Retail Sales dataset offers information on the liquor sales from the warehouse and retail channels. When comparing the amount of sales from each distribution channel, we can see that there are far fewer liquor sales from retail locations than there are from warehouse locations(Figure 1). This shows that there may be potential to increase sales for the retail distribution channel.



When sorting the sales by month, we can see that the retail and warehouse follow similar trends. Retail sales peak around July and September and are lowest in April and May(Figure 2). The warehouse sales by month graph follows a similar pattern(Figure 3), though warehouse sales are much higher than retail sales as shown by the y axis.

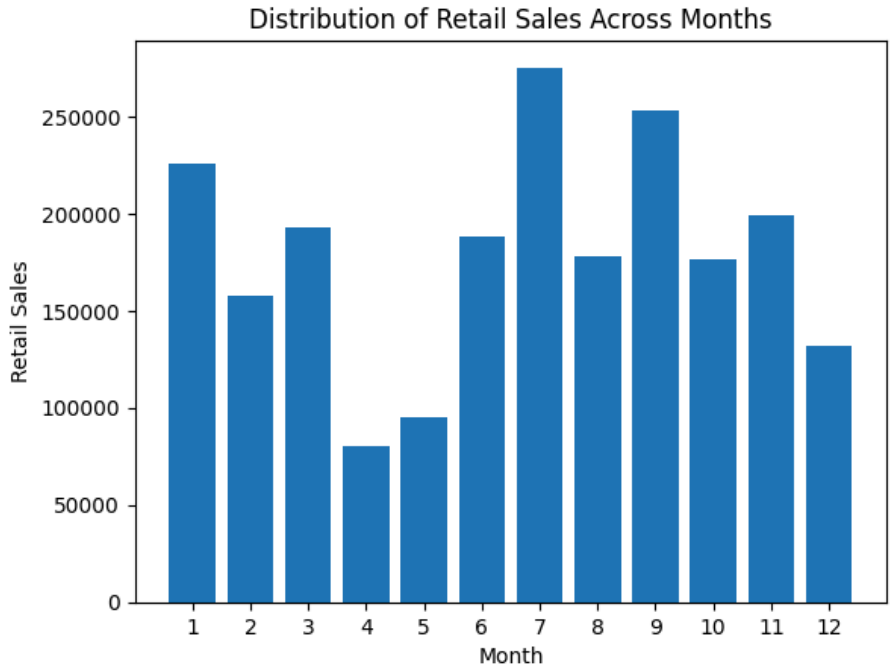


Figure 2

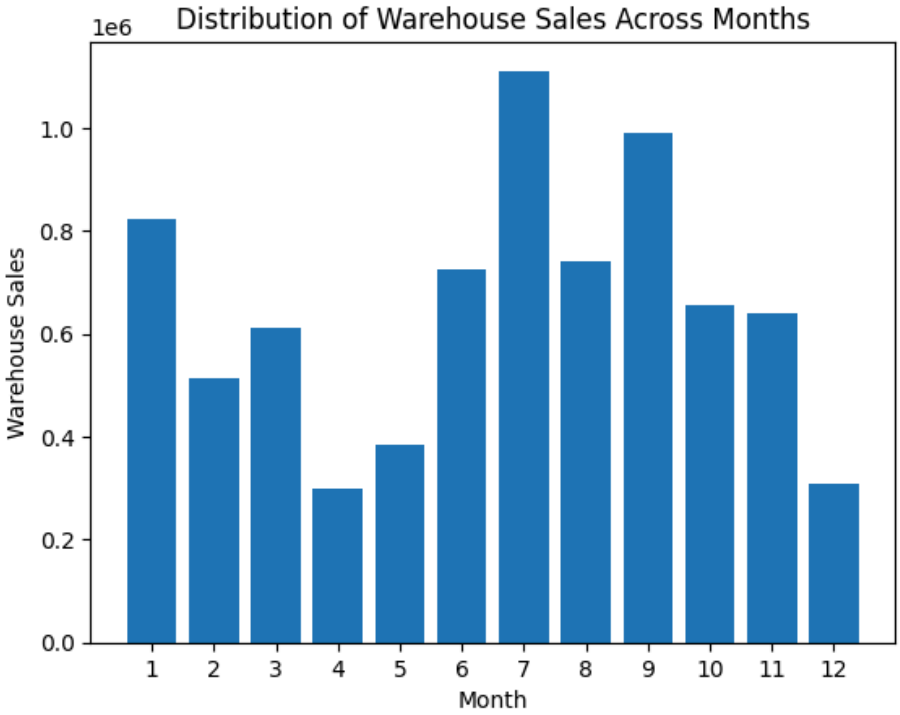


Figure 3

In order to analyze retail sales to look for potential methods to increase them, I used the K Nearest Neighbor, Decision Tree, Random Forest, and Neural Network supervised learning models to predict retail sales. For all of these models I used the variables year, month, item code, and retail transfers to predict the target variable of retail sales.

Out of all of these models, the Random Forest and Neural Networks had the lowest error prediction scores at 1.734. This indicates that these models can be useful in predicting the retail sales figures.

The Random Forest model predicted that retail sales would be 4.844 and the Neural Network predicted that retail sales would be 0.530 based on the test variables below:

Year: 2018
Month: 11
Item code: 1001
Retail Transfers: 1

While the models did not agree on a prediction in this case, they may still be useful in predicting retail sales, as their error prediction scores are relatively low. The models are also expected to still have errors, as their error prediction score was not 0.

Supervised learning models can be used to predict the retail sales of liquor based on predetermined test variables. This process can help liquor businesses to check what months need more of a focus on marketing efforts to increase their sales. The predictions can also help to find if certain item codes are expected to sell less, and if those items should be marketed more or if they are predicted to sell so little that they need to be discontinued. Altogether these predictions can help businesses to increase their retail sales by becoming more informed about what their retail sales are likely to look like under specific conditions.