



DATA

- The dataset has been taken from UCI Machine Learning Repository
- The client in this case is a UK-based and registered non-store online retail
- The data contains about 540,000 observations domestic and internationally
- The company mainly sells unique all-occasion gifts

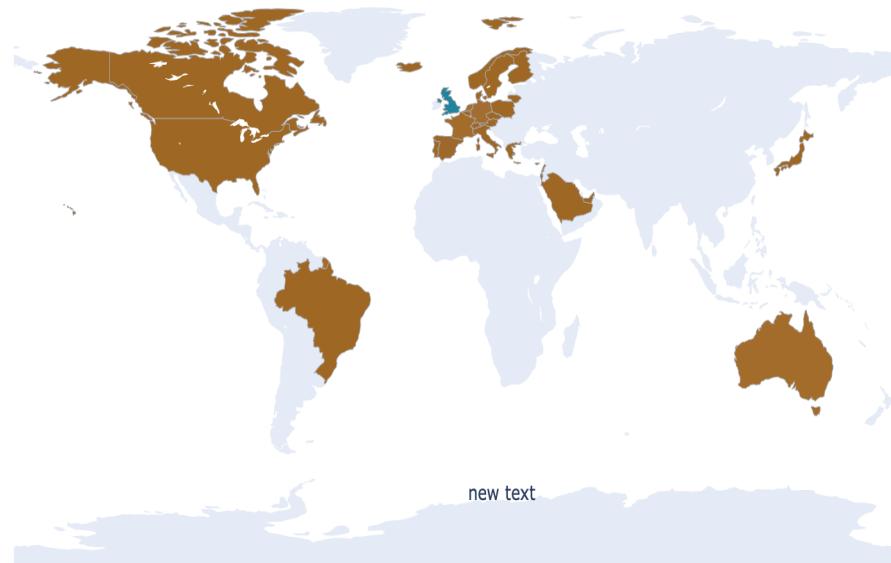
PROBLEM STATEMENT

- Due to the pandemic, online sales became very crucial for businesses. Forecasting sales and inventory management is one of the most important business problems for any retail entity.
- Forecasting sales and inventory management can help to gain even further insight into customer purchase behavior and sales predictions for online businesses.



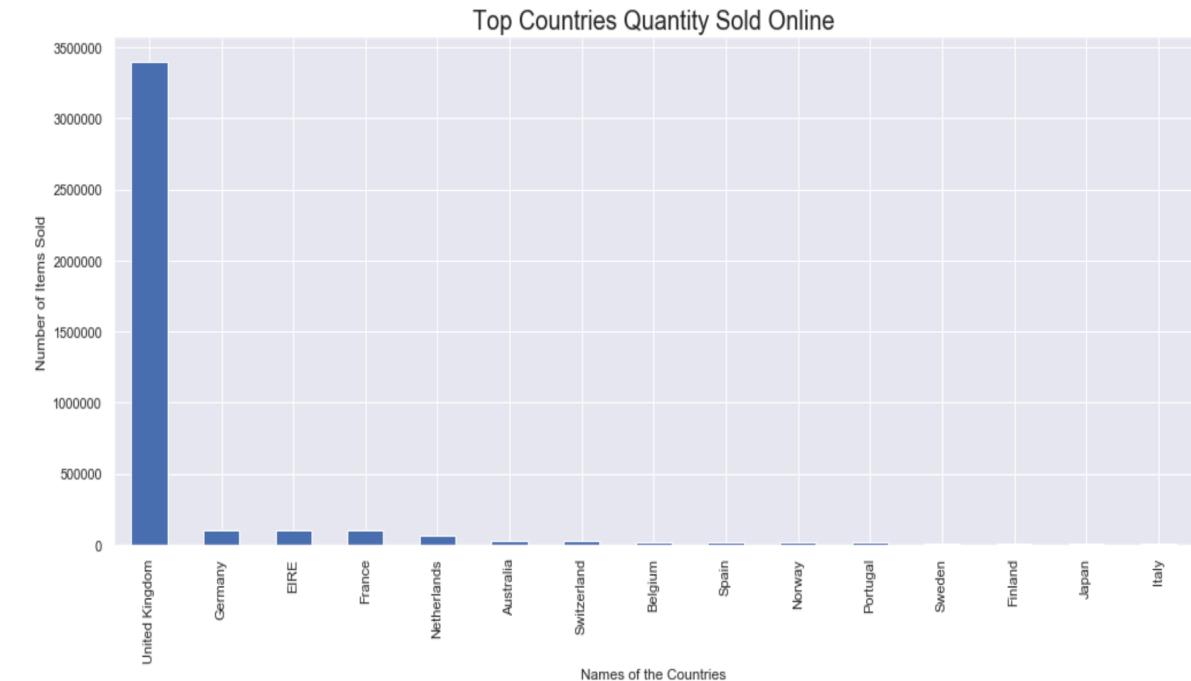
OBSERVATIONS

Sales by country



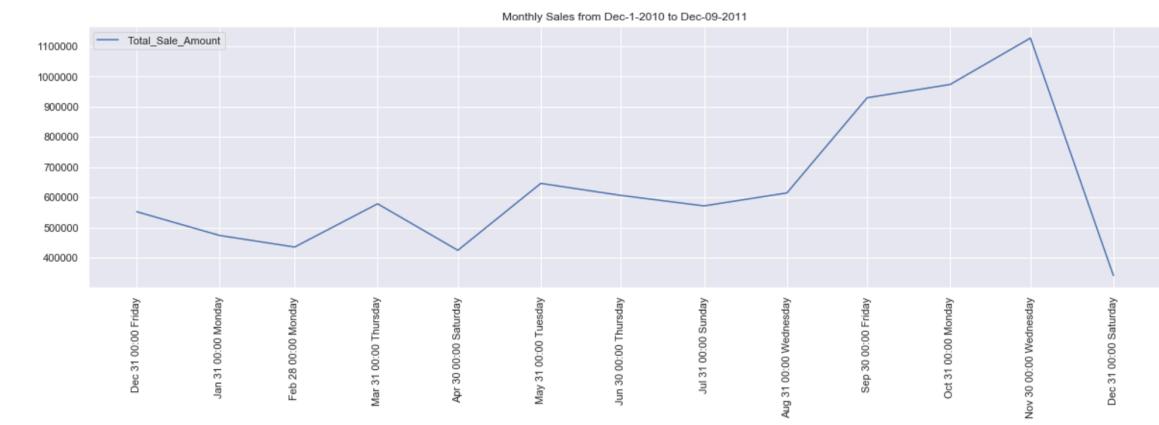
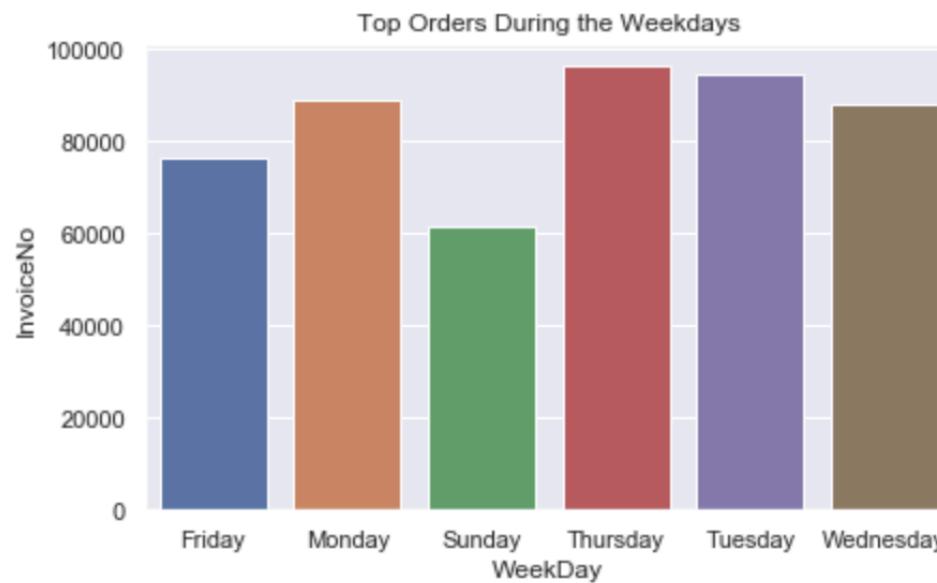
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- Most sales comes from UK and about 90% customers also are from UK
- Outside UK, most of the sales is from Europe
- In international sales, Germany, France, and Ireland are among the highest
- Outside UK, most customers are from Germany and France
- Outside Europe, highest sales comes from Australia, while the highest number of cancellations come from United States.



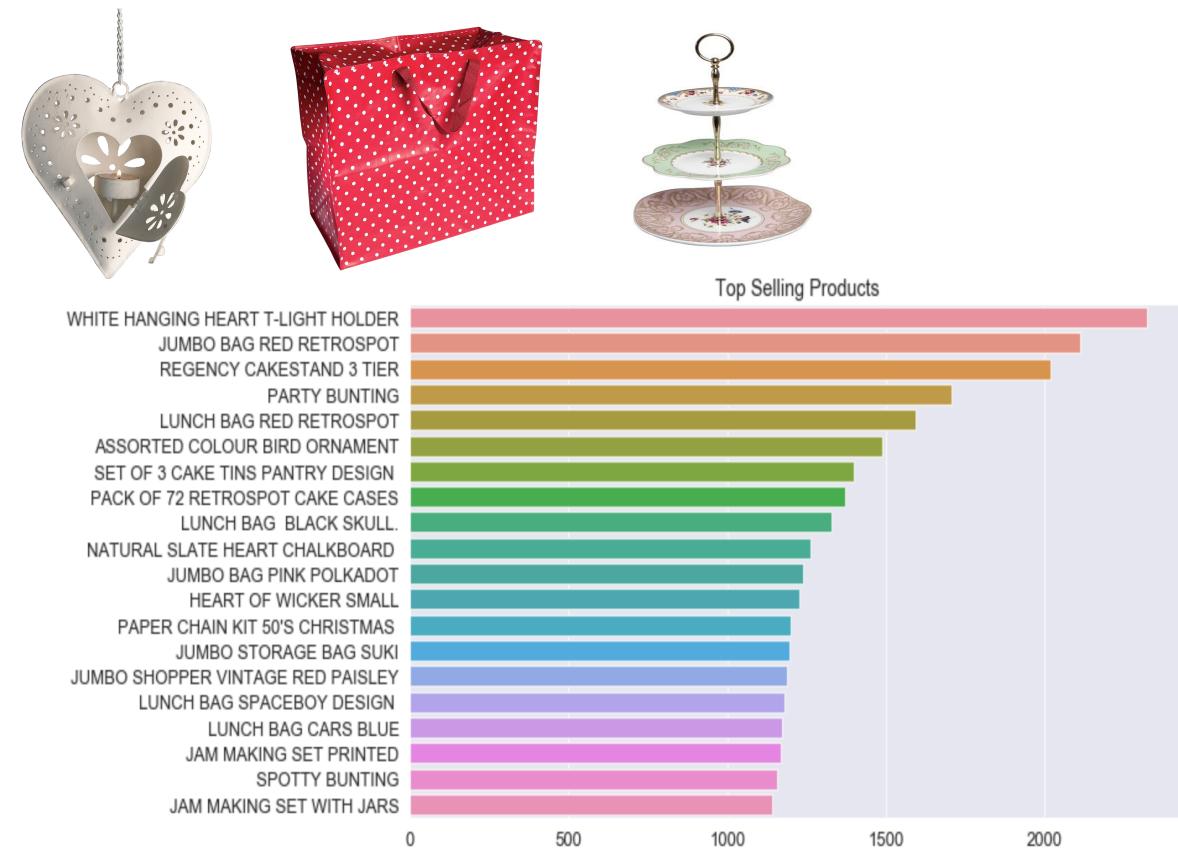
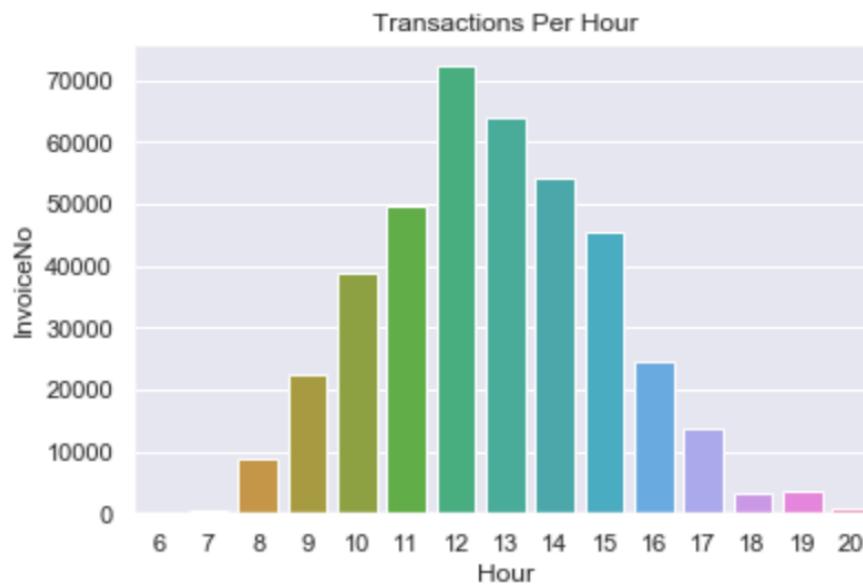
MONTHLY SALES & WEEKDAY SALES

- There is no sales happening on Saturdays.
- Most orders happened on Thursdays and Tuesdays
- The overall sales has increased through the months
- Sales falls during the holidays



TOP SELLING PRODUCTS AND TRANSACTION HOURS

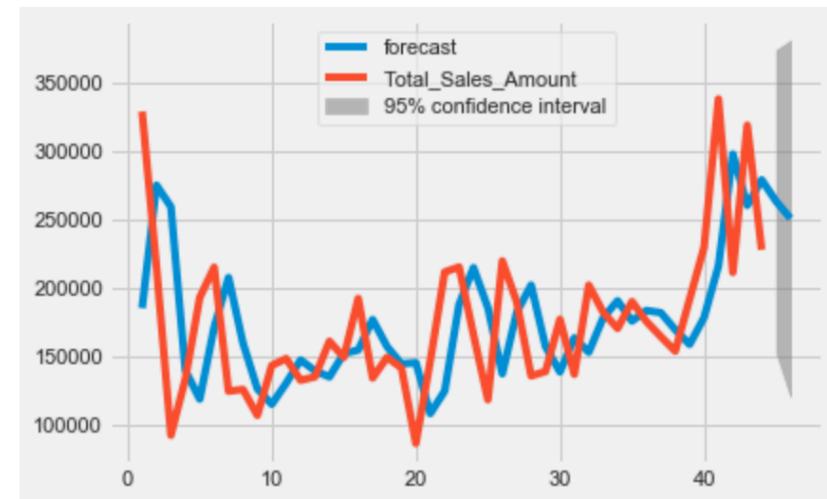
- Sales happens only during the working hours - between 8am and 8pm
- Most sales happening between 12 – 2 pm
- The No. 1 best selling product sells almost double the quantity of the 10th best seller



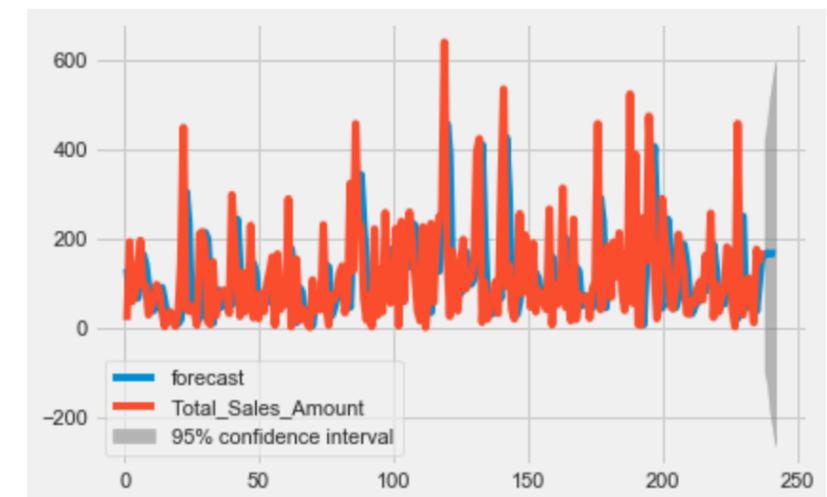
MODELING & STEPS

- Step 1 — Check stationarity: If a time series has a trend or seasonality component, it must be made stationary before we can use ARIMA to forecast.
- Step 2 — Difference: If the time series is not stationary, it needs to be stationarized through differencing. Take the first difference, then check for stationarity. Take as many differences as it takes.
- Step 3 — Filter out a validation sample: This will be used to validate how accurate our model is. Use train test validation split to achieve this
- Step 4 — Use the ACF and PACF for Fitting the ARIMA model
- Step 5 — Build the model: Build the model and set the number of periods to forecast. (As we forecast further out into the future, it is natural for us to become less confident in our values.
- Step 6 — Validate model: Compare the predicted values to the actuals in the validation sample.

Weekly Trend and Forecast



Lunch Bag Red Retrospect and Forecasts



FURTHER ANALYSIS AND CONCLUSION



Why there is no sales on Saturdays



How to improve sales during the holidays



Model improvement & Modifications



Model Automation



Using our model on other datasets

ANY QUESTIONS

