



## DATA

- UCI Machine Learning Repository Link:  
<http://archive.ics.uci.edu/ml/datasets/online+retail#>
- Online UK-based retail (all-occasion gifts)
- Sells domestically and internationally
- 540,000 observations



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## PROBLEM STATEMENT

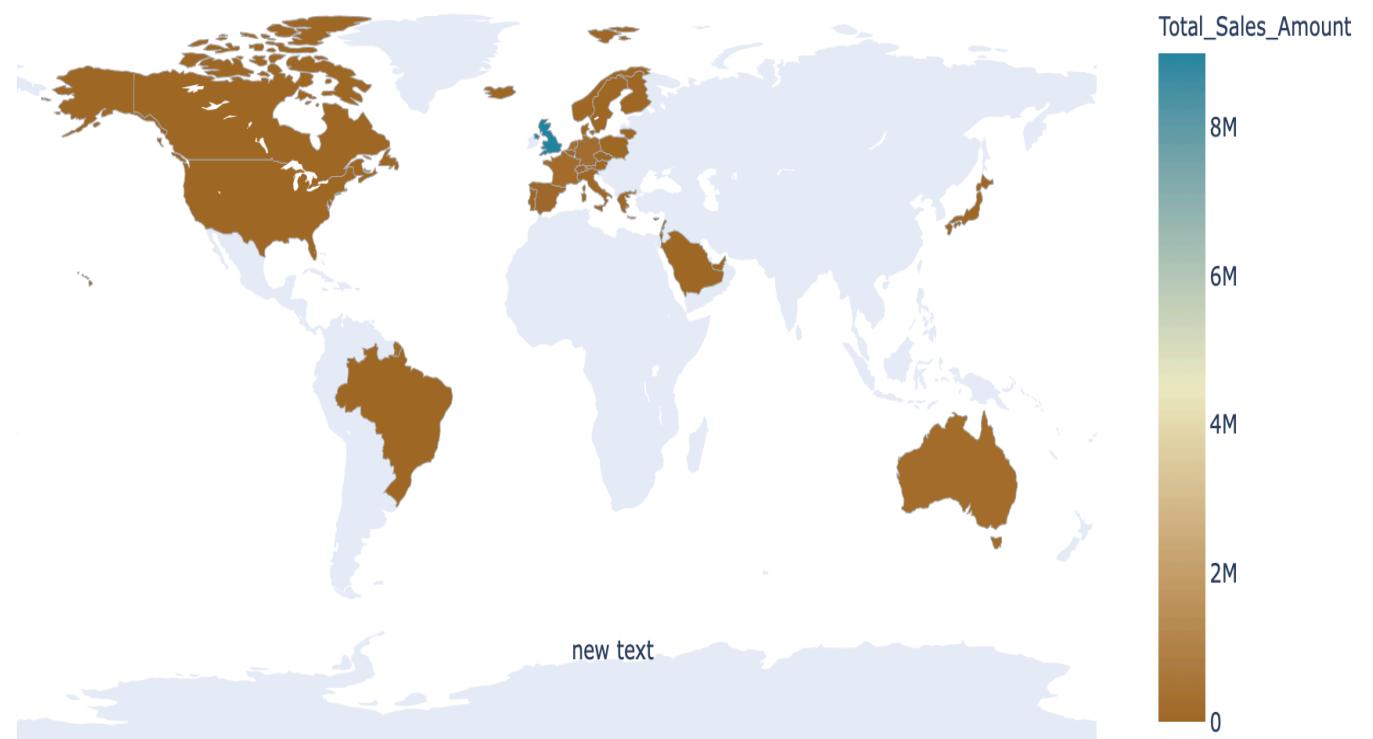
- Online sales are very crucial for businesses.
- Inventory and sales forecasting is important for all retailers
- Cost Reduction
- Better Inventory Management
- Improve Business decision makings

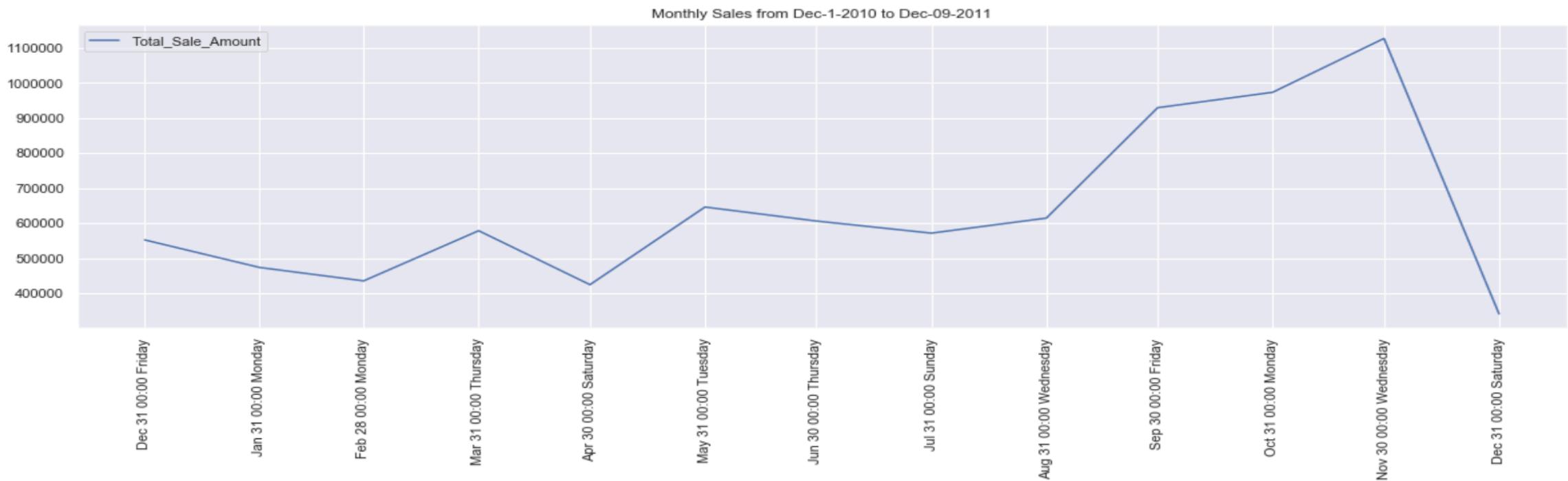


# OBSERVATIONS

- About 90% of customers and sales are from UK
- Outside UK, most sales are from Europe
- Highest international sales are from Germany, France.
- United States had the highest cancellation rate

Sales by country



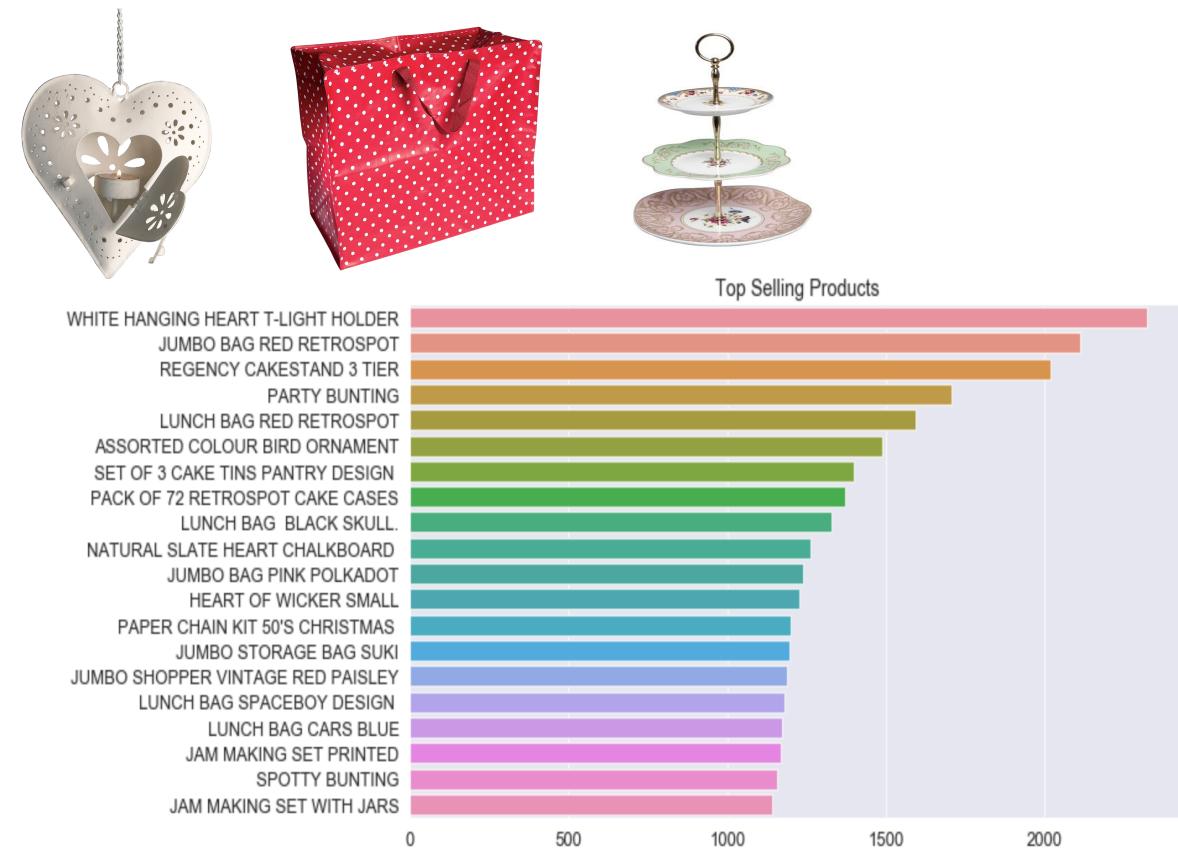
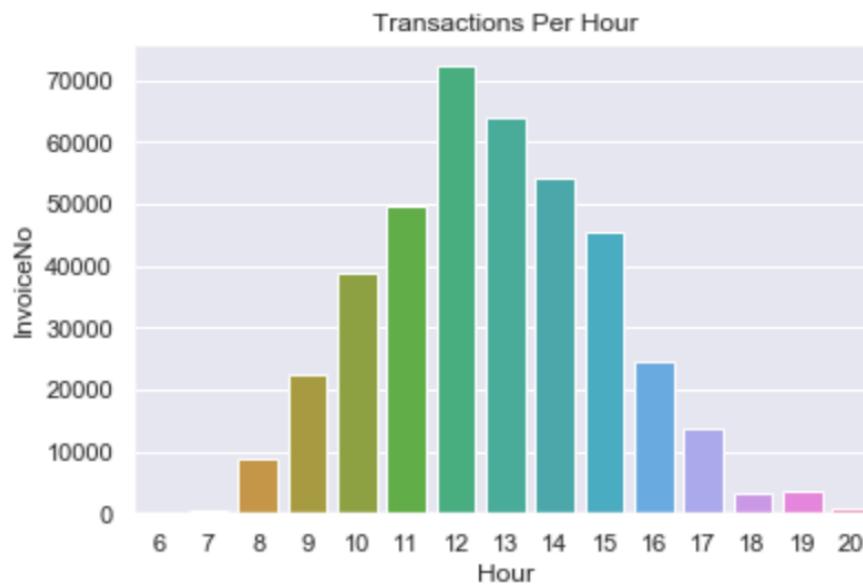


## MONTHLY SALES & WEEKDAY SALES

- 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

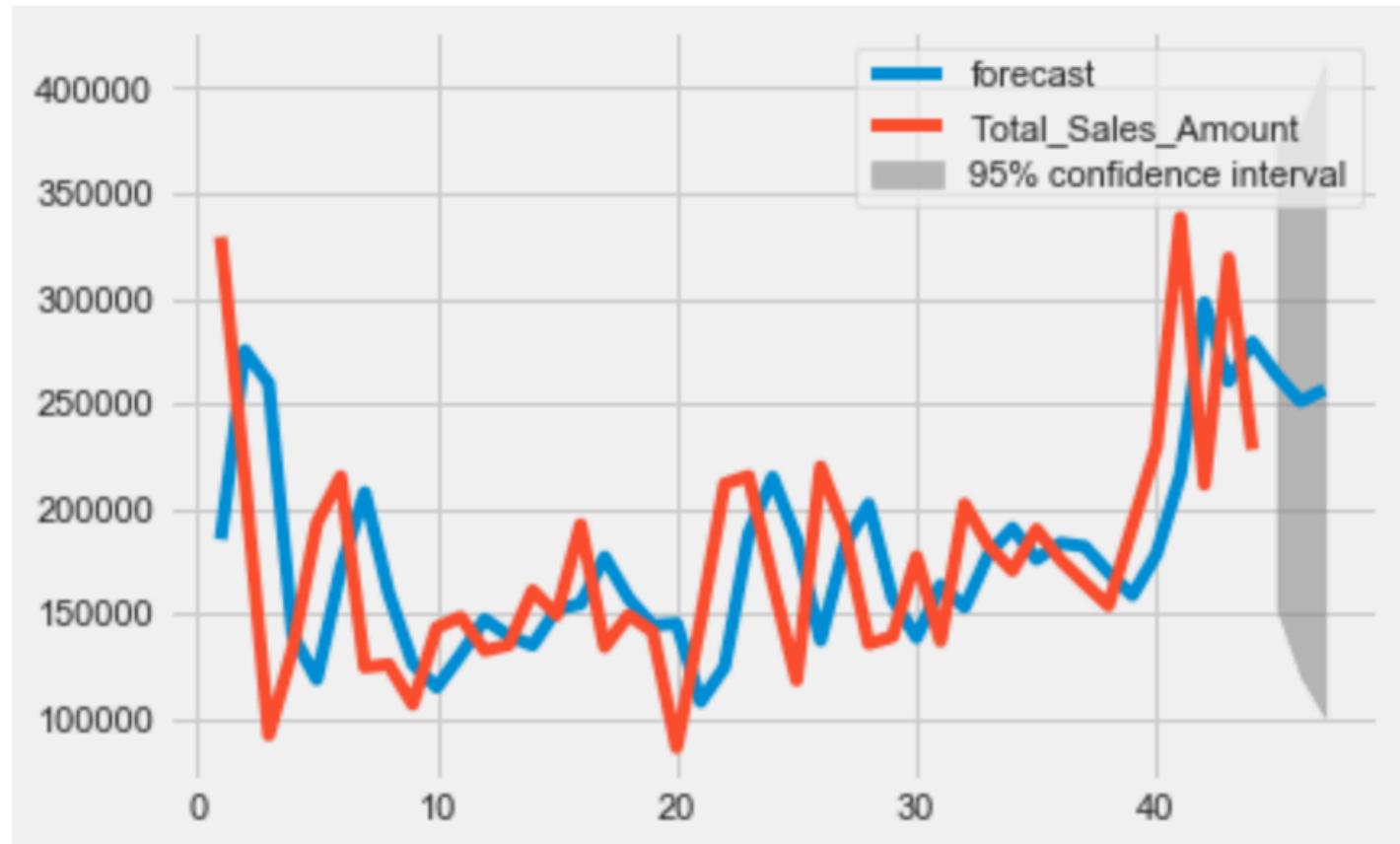
- Sales happens only during the working hours - between 8am and 8pm
- Most sales happening between 12 – 2 pm
- The No. 1 best selling product sells almost double the quantity of the 10th best seller



# COMPANY WEEKLY TREND & FORECAST

- ARIMA statistical model & RMSE metric
- Predicted values is close to observed values.
- Spikes close to holiday sales
- Sales drops in mid Jan and May
- Upward Trend

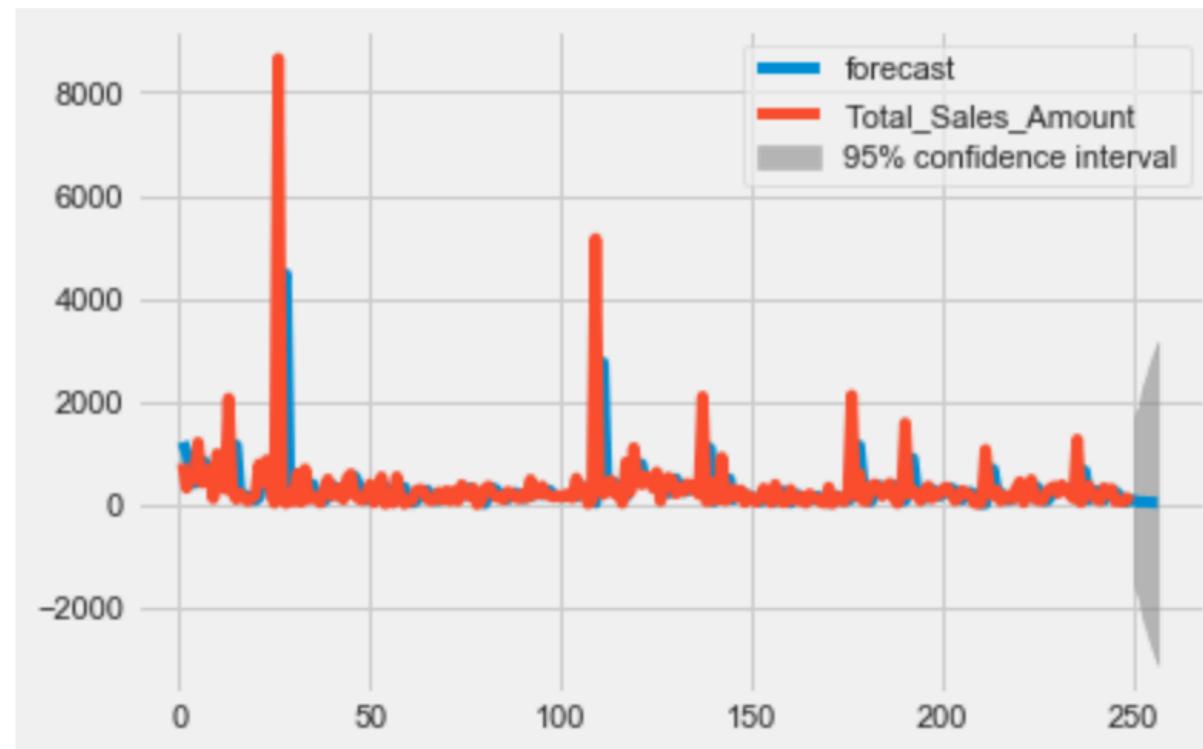
## Weekly Sales Trend and Forecast



# DAILY PRODUCT TREND AND FORECAST

- There is downward forecast in October
- The spike decreases towards the end of the year
- Highest sales in Valentine , Easter, White Sunday, Ascension Day, Father's Day

White Hanging Heart T-Light Holder Daily Trend and Forecast





WHY THERE IS NO  
SALES ON  
SATURDAYS



MORE DATA



MODEL  
IMPROVEMENT &  
MODIFICATIONS



MODEL  
AUTOMATION



USING OUR MODEL  
ON OTHER  
DATASETS



FURTHER ANALYSIS

# CONCLUSION



Helps decision making



Inventory and sales  
forecasting is important  
for all retailers



Can save cost



Sales forecast don't need  
to be perfect to be  
valuable

# THANK YOU! ANY QUESTIONS?

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