

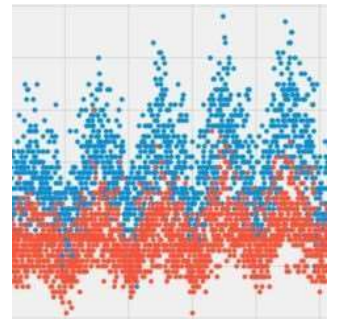
IBM Coursera Advanced Data Science Capstone

JASH




Data set - demand prediction

- Time series data
- Kaggle - Store Item Demand Forecasting Challenge
- Task: Predict 3 months of item sales





Use case - time series forecast

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- short-term success of companies, products, and services
 - Business forecasting for operational business - production plan, financing

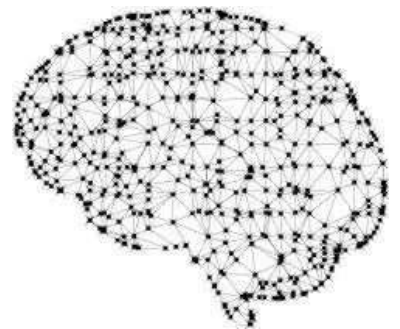
DEMAND





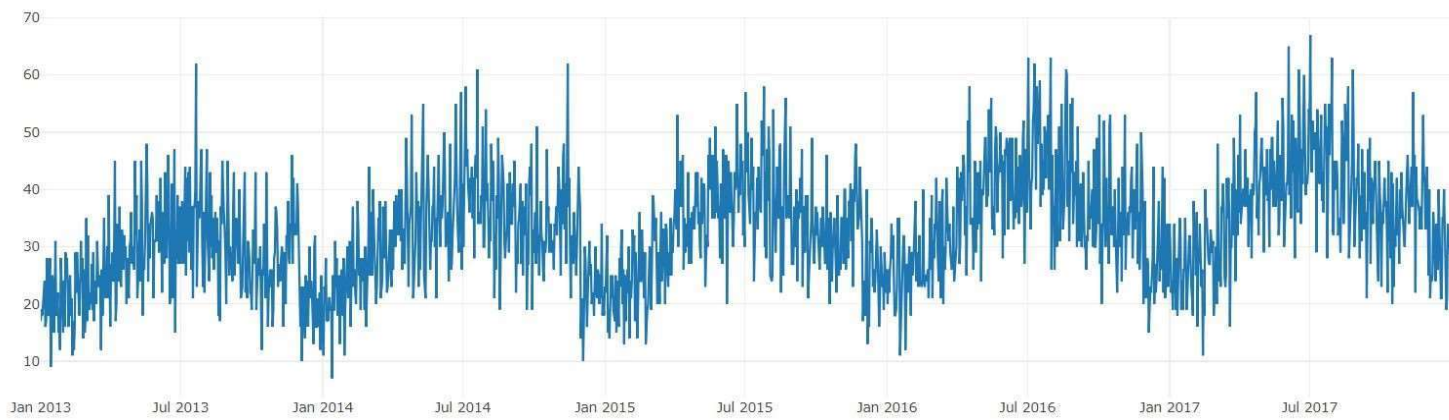
Solution algorithm

- ARIMA
- Neural Network
- Long short-term memory - NN
- XGBoost
- **Prophet (presentation topic)**





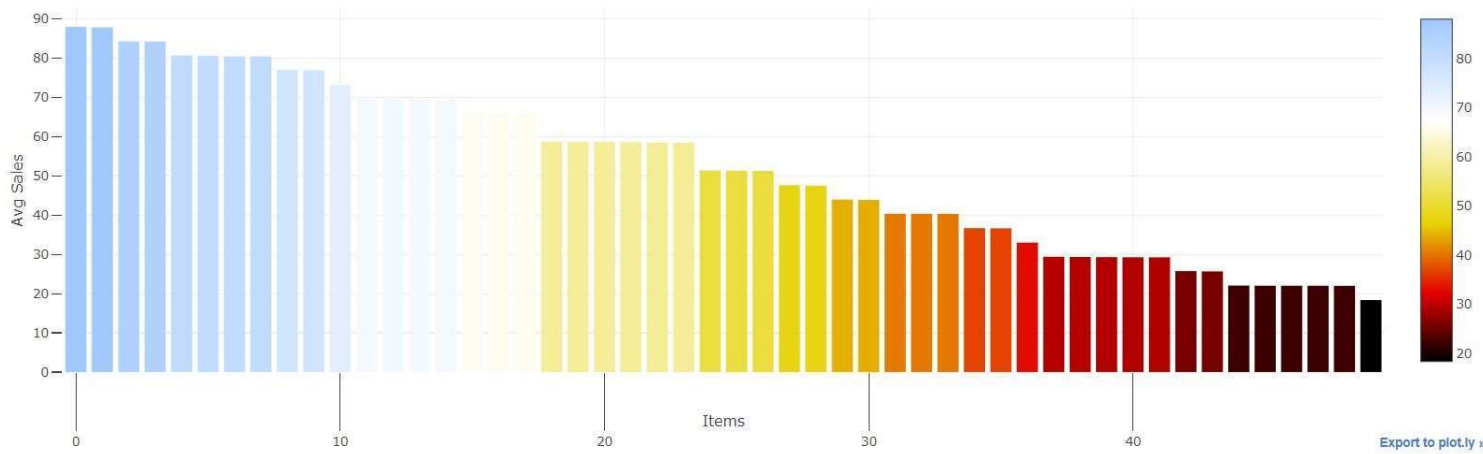
Data assessment





Data assessment

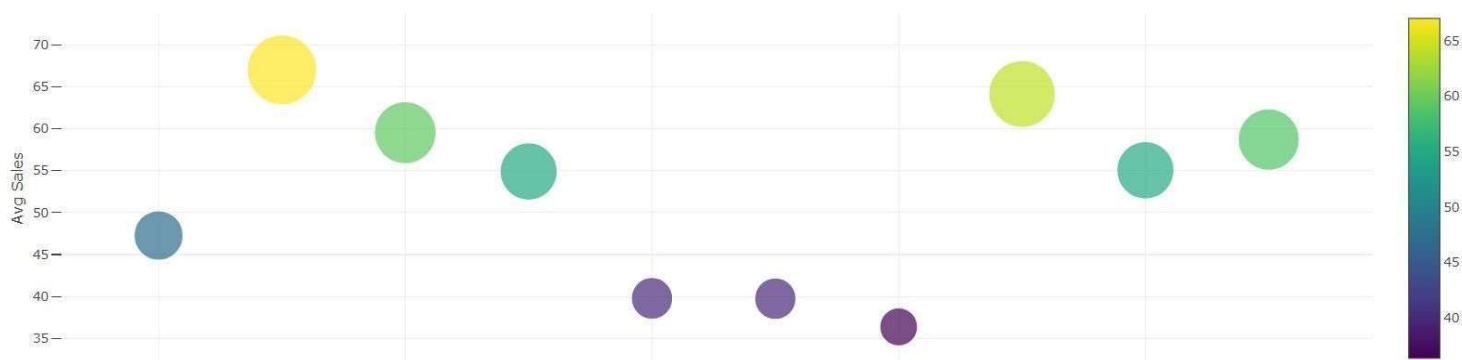
Scatter plot of avg sales per item





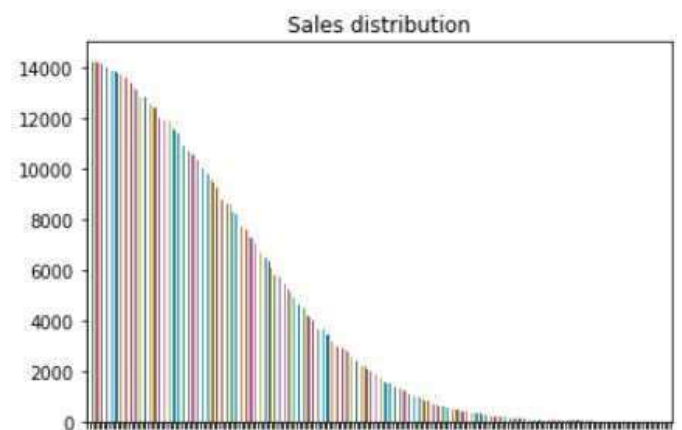
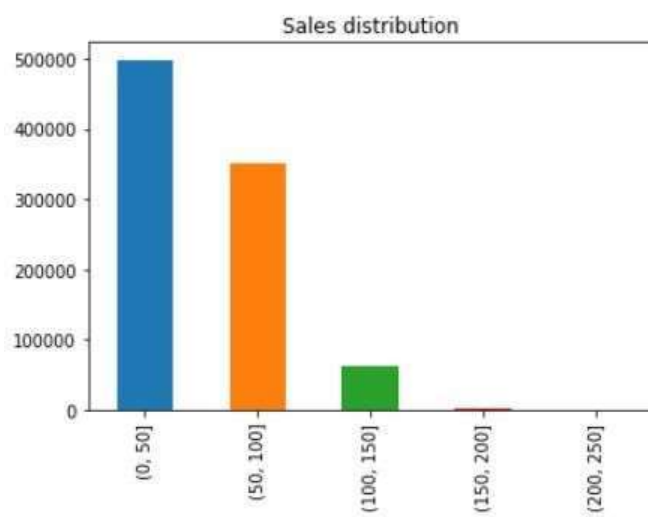
Data assessment

Scatterplot of individual store sales





Data assessment





Prophet algorithm components

$$y(t) = g(t) + s(t) + h(t) + \epsilon$$

$g(t)$ = Trends $s(t)$ = Seasons

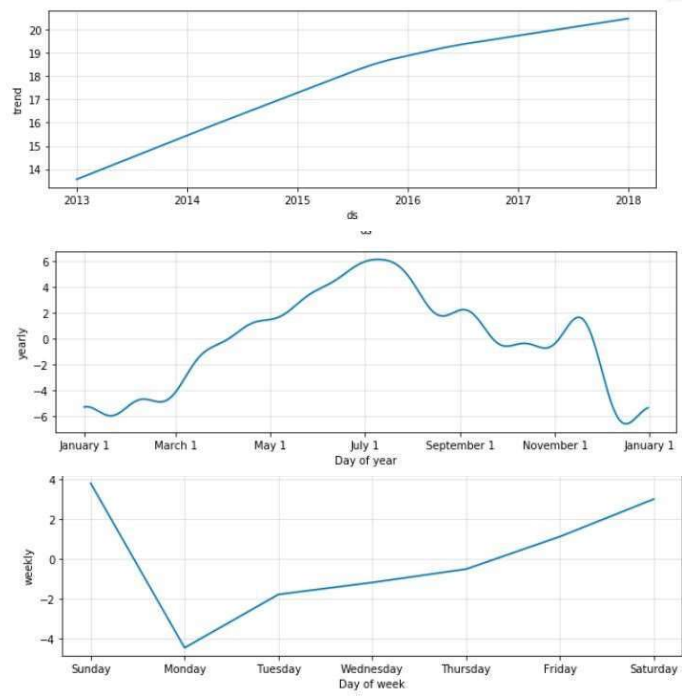
$h(t)$ = Cycles (holiday)





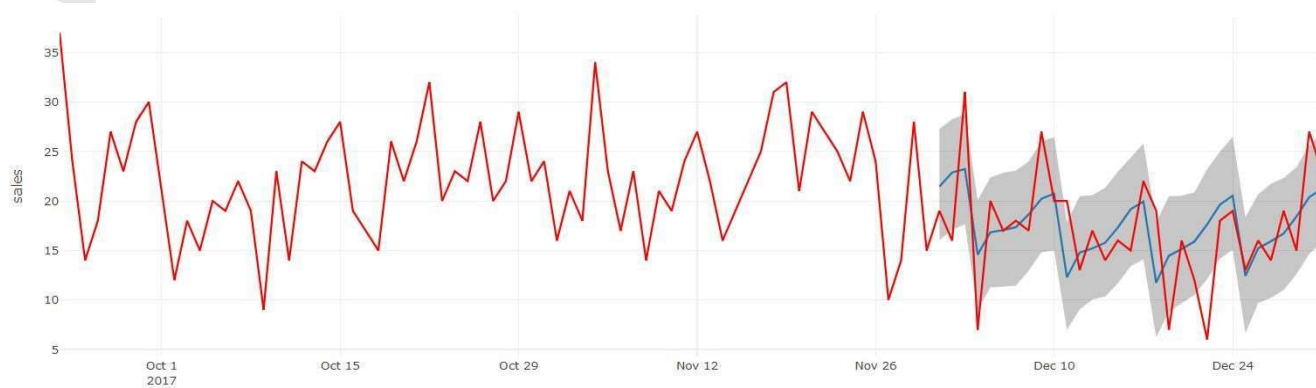
effects) $t = \text{Irregularities}$

(error term)





Model performance



MAE 3.490
MAPE 26.26



Further Resources

Facebooks Prophet paper - <https://peerj.com/preprints/3190.pdf>