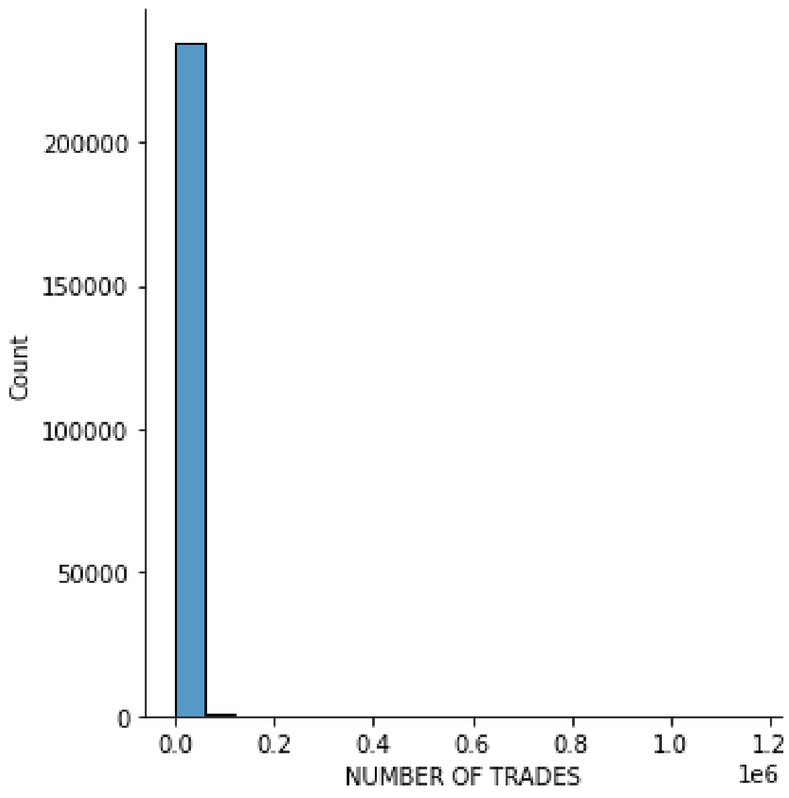
Trade AI-ML Case Study

In the Trade industry, traders' salaries are often influenced by the number of trades they make. However, predicting the salary of a trader based on the number of trades they perform can be challenging due to the complex and dynamic nature of financial markets. Therefore, the problem statement is to develop a Auto-ML and artificial intelligence model that can accurately forecast the salary of traders based on the number of trades they execute.

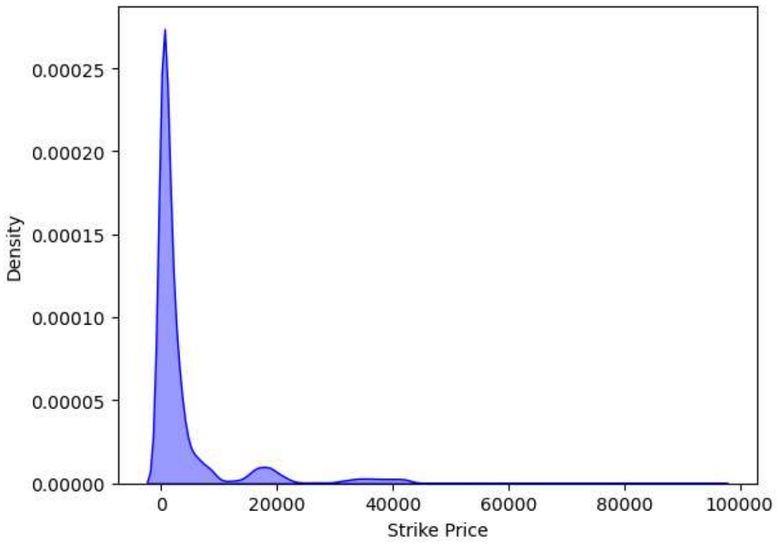
The model should take into account various factors such as Amounts paid to employees working in excess of 40 hours per week, highest closing price of stock, buy or sell a specified quantity of an asset at a specified price to provide reliable salary predictions for traders. The solution will help financial institutions to make informed decisions when setting salaries for traders, and traders to gain a better understanding of the potential earnings associated with their trading activities.

The main goal is to predict the number of trades and help to identify the factors that determine trading using Auto-ML.

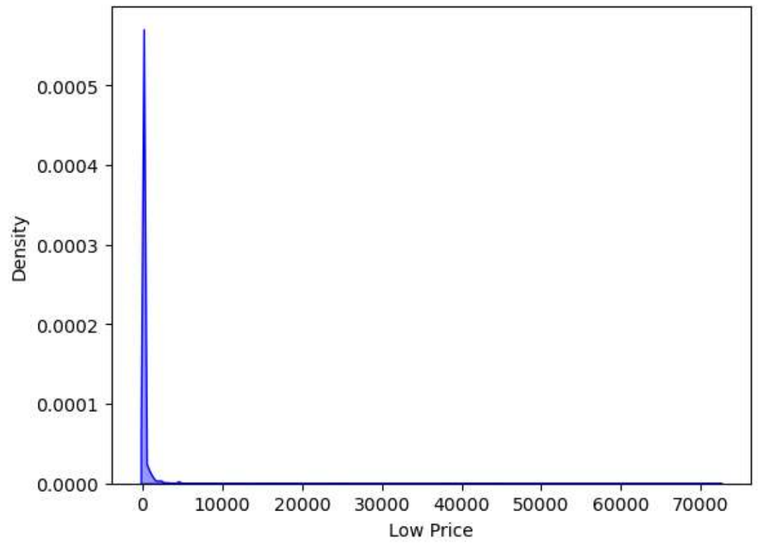


- The business feature that we have used here is ‘Number of trades’.
- The number of trades is a key metric in the trading industry that represents the frequency of buying and selling activities in the market.
- It indicates the:
    - Liquidity of an asset
    - Measure efficiency of the market
    - It can affect the transaction cost of the trader
- The distribution plot shows that there has been more than 200,000 trades in this dataset.

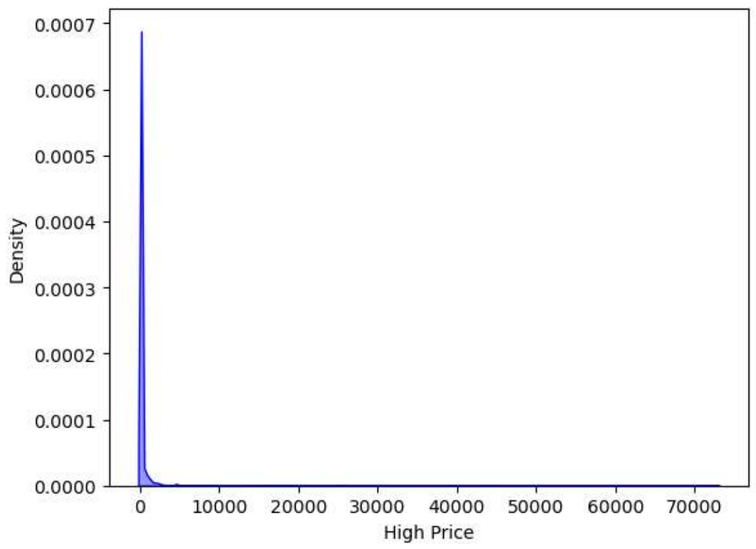
Features Responsible



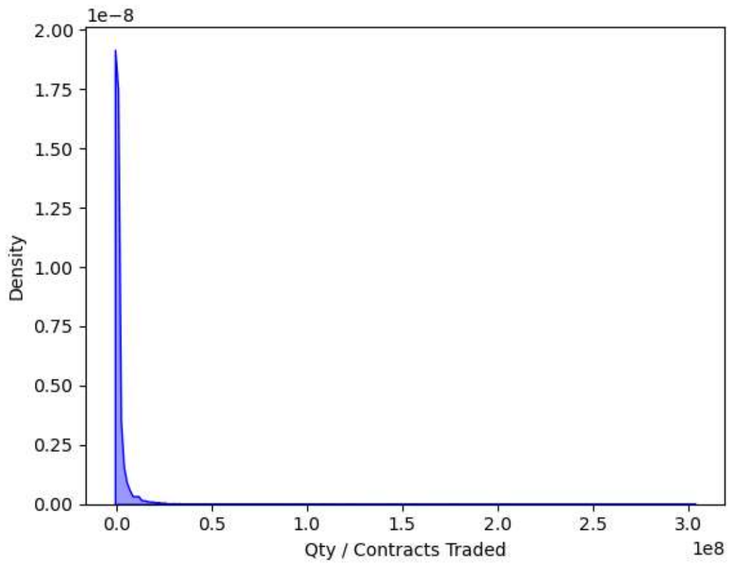
- **Strike Price =** price fixed by the seller



- **Low price** = Amounts paid to employees working in excess of 40 hours per week



- **High Price =** highest closing price of stock



- **Qty/Contracts Traded =** buy or sell a specified quantity of an asset at a specified price

Auto-ML Methodology Results

Algorithms	Test Accuracy (25 percentile)	Test Accuracy (50 percentile)	Test Accuracy (75 percentile)	Test Accuracy (90 percentile)
Lasso	79.2	80.9	80.9	80.9
Random Forest	97.1	98	98	98.2
XGBoost	97.5	98.2	98.2	98.3
MLP	85	60	78.1	73.8
RNN	62.17	71.95	55.48	43.2
Total Features	7	14	21	26
Avg. Accuracy	84.194	81.81	82.136	78.88

- **Based on our observation from the standard ML algorithms, 25th percentile has the best average accuracy.**
- **MLP has the best performing algorithm accuracy with 98.3% accuracy in 90 percentile.**

Conclusion

Auto-ML models are transforming the trading industry by providing powerful tools for analyzing and predicting market trends, identifying patterns and anomalies, and making more informed investment decisions. Auto-ML algorithms can be used to develop predictive models that forecast market trends and predict asset prices. The dataset has 235,184 records with 8 Categorical and 14 Numerical Features.

For Regression, models were created with algorithms using Auto-ML techniques like Lasso, Random forest, XGBoost, Multilayer Perceptron and Recurrent Neural Network. With these models, performance measurement values were obtained for feature sets of 7, 14, 21 and 26. The Auto-ML algorithms were able to predict the no.of trades with an average accuracy between 78% – 85% and helped to determine features that influence number of trades. The major features include Strike Price, Low Price, High Price and Qty/Contracts Traded. The Random forest with 98.2 % accuracy in 90th percentile where tree showed a threshold of Values (in Lacs) >= 12203405.5 units and Lot Size>=10 units which leads to highest no.of trades.

Overall, Auto-ML models has the potential to help improve accurate trading decisions based on real-time market data. These algorithms can take into account a wide range of factors, such as market trends, news and events, and historical data, and can execute trades with speed and precision.