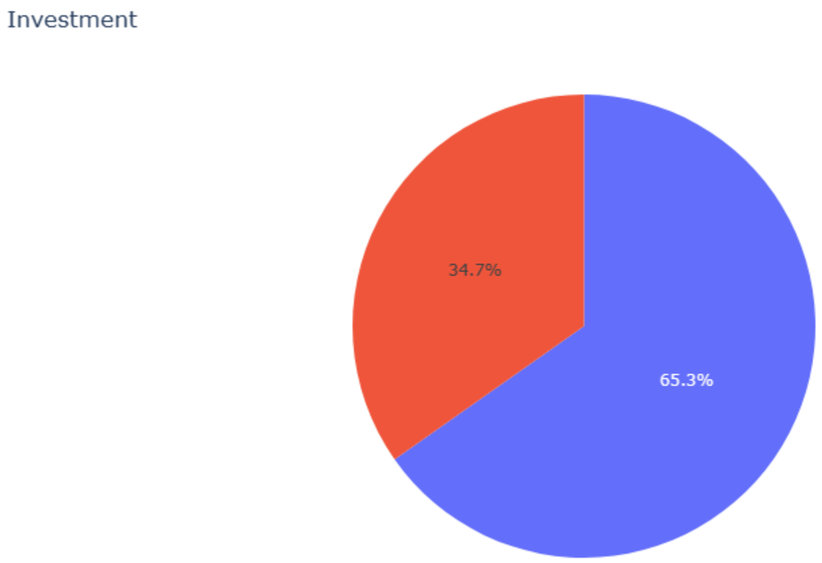
Investment AI-ML Case Study

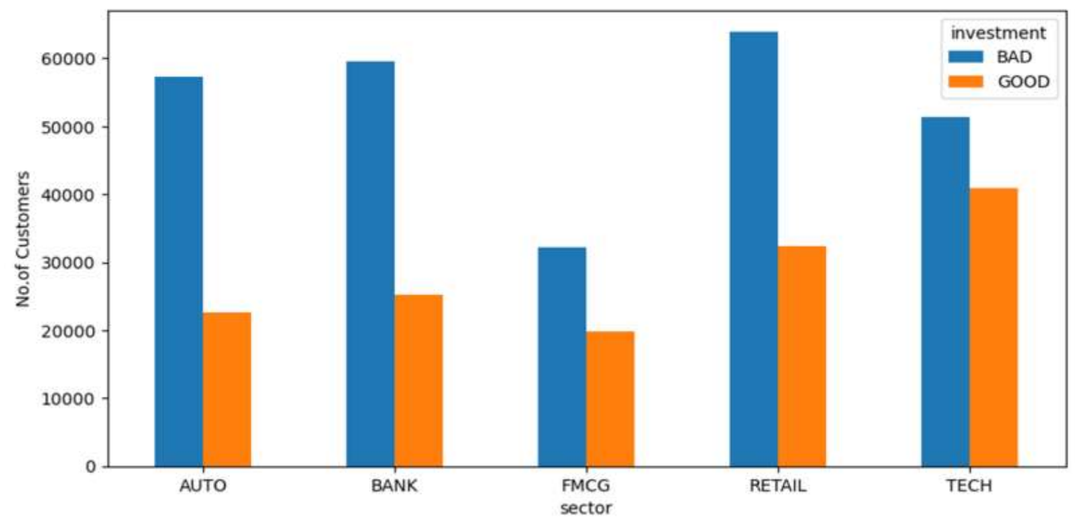
The investment industry is characterized by high uncertainty, where investors are constantly seeking to maximize returns while minimizing risks. The success of an investment is influenced by numerous factors such as market conditions, economic indicators, company financials, and industry trends. With the increasing amount of data available, it has become increasingly difficult for investors to make informed decisions on which investment options to choose. Auto-ML algorithms can provide a solution to this problem by using historical data to make predictions and classify investments as good or bad.

The objective of this Auto-ML problem is to classify investment options as good or bad based on various factors such as market trends, financial indicators, and economic conditions. The model will be trained on a dataset of historical investment data, and it will use this data to learn patterns and make predictions on new investment opportunities.

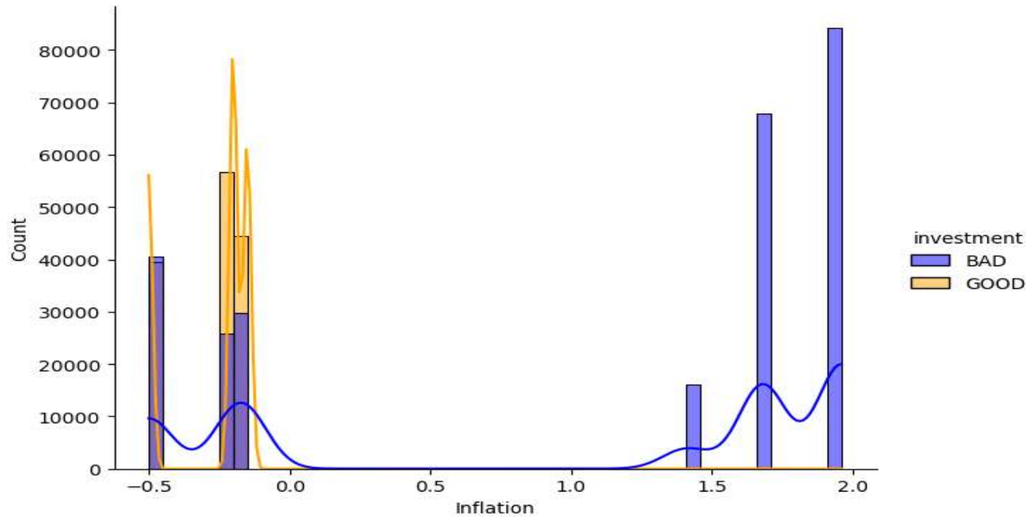


Investment	Count
Good	140818
Bad	264440

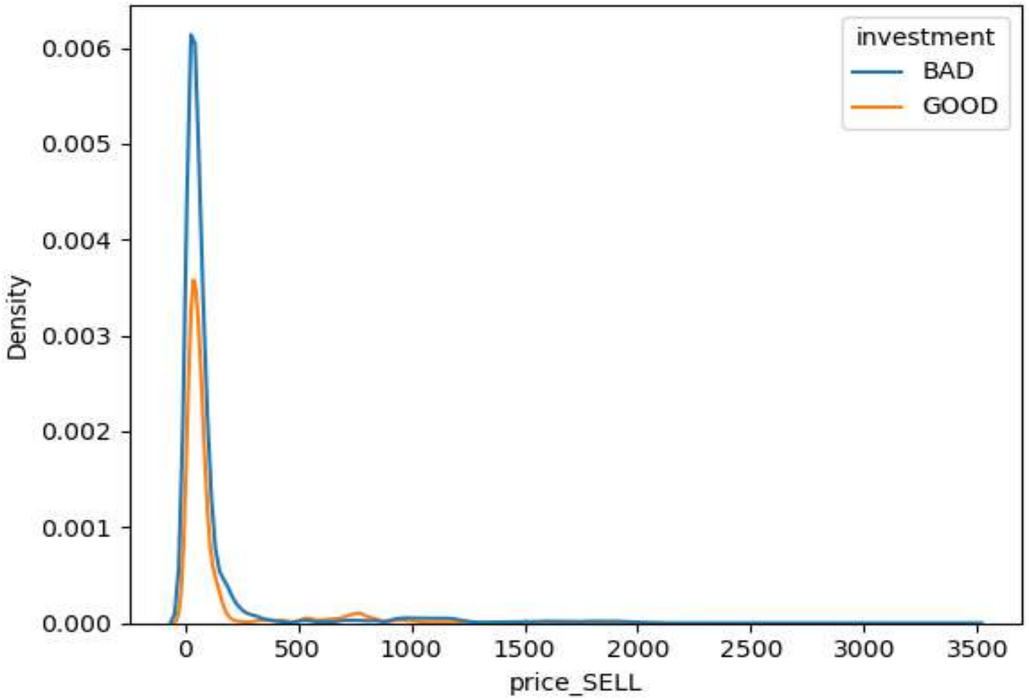
Features Responsible



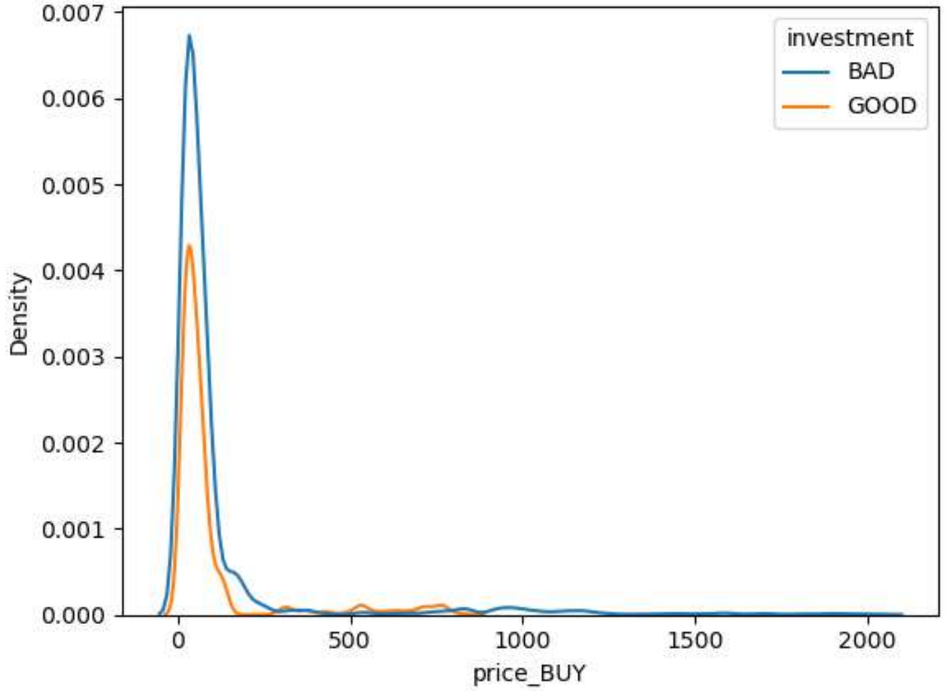
By analyzing the performance of various **company sectors** and how they are affected by different economic and market conditions, investors can make more informed decisions about their investments. Here Retail and Banking sectors had good investments



When the **inflation rate** is high, the purchasing power of the currency decreases, meaning that investors can buy less with their money. This can lead to a decrease in the real value of investments and can make certain types of investments, such as cash or fixed income, less attractive.



Price of Sell: If the company performs well and generates profits, then the investment is more likely to result in a good selling price. Conversely, if the company underperforms and generates losses, then the investment is more likely to result in a bad selling price.



Price of Buy: When an investment is bought at a low price, there is a greater chance of it yielding a high return, and therefore being considered a good investment. On the other hand, when an investment is purchased at a high price, there is a greater risk of it yielding a low return or even a loss, making it a bad investment.

Auto-ML Methodology Results

Case	Percentile	No. of Features	Random Forest	XGBoost	RNN	MLP	Decision Tree	Avg. Accuracy
Case 1	25	7	100	100	99.33	99.99	100	**99.86**
Case 2	50	13	100	100	98.45	99.94	100	**99.67**
Case 3	75	20	100	100	98.47	99.96	100	**99.68**
Case 4	90	24	100	100	98.87	99.97	100	**99.76**

- Based on our observation , Random forest, XGBoost and Decision Tree was the best performing algorithm with 100% accuracy in across all percentile.
- 25^{th} percentile is the best percentile with an average accuracy of 99.86%.

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Conclusion

In conclusion, predicting good or bad investments is a critical problem for the investment industry. In this context, Auto-ML algorithms can be used to classify good or bad investments based on various factors. The factors that impact the performance of investments are diverse and can vary depending on the investment strategy or the investment instrument. The dataset has 4,05,258 records with 5 Categorical Features and 19 Numerical Features. 65.3% of the dataset implies bad investment.

For classification, models were created with algorithms using Auto-ML techniques like Decision Tree, Recurrent Neural Network, Multilayer Perceptron, Random forest and XGBoost . With these models, performance measurement values were obtained for feature sets of 7, 13, 20 and 24. The Auto-ML algorithms were able to predict whether an investment is good or bad with an average accuracy between 98% – 100% and helped to identify factors that determine good or bad investments . The major factors include Company sector, Inflation, Price of Buy and Price of Sell. When the results are examined, it is observed that with the addition of each new feature, the success of classification decreased. Based on the performance measurement values obtained, it is possible to say that the study achieved success in classifying whether an investment is good or bad.

By accurately classifying investment options as good or bad, investors can make informed decisions and minimize risks while maximizing returns. This can lead to better investment portfolios and ultimately improve the performance of the investment industry. Auto-ML can provide a powerful tool for the investment industry to analyze and make informed decisions based on historical data.

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