Microsoft Stock Price Prediction

TYLDS Project Report

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Abstract:

In this study, we explore the use of deep learning models to predict Microsoft stock prices, with a focus on achieving higher accuracy. Our analysis reveals that the LSTM (Long Short-Term Memory) model outperforms others, yielding a minimum Root Mean Square Error (RMSE) of 11.222516%.

Problem Statement:

Our objective is to employ technical analysis, focusing on the dataset of Microsoft stock prices from April 2015 to April 2021. We aim to build a model capable of estimating stock prices by utilizing variables such as date, open, high, low, close, and volume. The closing price serves as our target variable.

Models Used for Prediction:

Our objective is to employ technical analysis, focusing on the dataset of Microsoft stock prices from April 2015 to April 2021. We aim to build a model capable of estimating stock prices by utilizing variables such as date, open, high, low, close, and volume. The closing price serves as our target variable.

1. **Linear Regression** Linear Regression is a basic yet widely-used machine learning algorithm employed to establish relationships between independent and dependent variables. Despite attempts to extract features from the date column, the model's performance falls short of our expectations.
2. **K-Nearest Neighbours (kNN)** Utilizing kNN, we aim to identify similarities between new and existing data points. However, akin to linear regression, the model's performance fails to meet our desired standards, indicating its inadequacy for this particular dataset.
3. **Long Short-Term Memory (LSTM)** LSTM emerges as a promising technique for sequence prediction due to its ability to retain past information while discarding irrelevant data. Despite its effectiveness, the model's predictions alone may not suffice for anticipating stock price fluctuations influenced by external factors such as news and intangible variables.
4. **Decision Trees** Decision Trees offer a structured approach to decision-making by recursively dividing data into subsets based on features that yield the most substantial information gain at each step. This method provides transparency and interpretable results, which are invaluable for deciphering underlying patterns in the data. However, its performance in predicting Microsoft stock prices does not meet our expectations, falling short of the desired level of accuracy.