Abstract:

Making predictions about the stock market is challenging, since there are many factors that influence how the market behaves. For my project I’m predicting the Istanbul Stock Exchange (ISE) using the data from the UCI machine learning repository. There are several features in the dataset such as a, b, c.., and the primary attribute is the ISE feature, which is used to predict stock values using the machine learning models. The goal of this project is to compare how well two model forecast the ISE index: Long Short-Term Memory (LSTM) and Autoregressive Integrated Moving Average (ARIMA). Finding the model with the highest accuracy while utilizing the least amount of data input is one of the goals. By creating the model architecture, assess the model performance and figure out the best model for short-term stock prediction by studying the relevant literature on predicting stock using LSTM and ARIMA. The understanding of the stock exchange trends and the effectiveness of models in financial forecasting will be enhanced by the result of this study.

**Introduction:**

**Background**

Because of several factors that may impact market behavior in addition to the regular fluctuations in prices, predicting stock market values is a difficult and complex undertaking. Forecasting the stock market’s future using the past data and other influencing factors is referred as stock market prediction. The ability to make better decisions and control risk is one of the main advantages that offers the investors, financial analysts and traders to reduce risk and make smarter judgements. The applications of machine learning and statistical models in financial forecasting has been developing with an aim of improving the accuracy and confidence of investing predictions.

One important financial market that represents Turkeys economy performance and investment opportunities is the Istanbul Stock Exchange (ISE). Both domestic and foreign investors can benefit from understanding and forecasting the ISE attribute. A dataset from the UCI machine learning repository, which has multiple financial variables, is used in this work. The above features are essential in developing predictive models and fully understanding the connections between the targeted variable and other financial metrics.

Problem Statement

This study’s main goal is to use the historical financial data to anticipate the Istanbul Stock Exchange (ISE) with accuracy. Choosing the right model for prediction is important because of the complexity of financial markets. Even though they are widely used, traditional time series models like ARIMA might not be able to properly represent complex dependencies on time and non-linear relationships. On the other hand, advanced deep learning models such as LSTM network have shown progress in processing sequential data; however, they require sufficient training data and appropriate tuning. The objective of this research is to evaluate and compare the ISE indices forecasting performance of the LSTM and ARIMA models in order to identify which model requires less data to provide forecast that are more accurate.

Justification of the study

Research Questions

Aims and Objectives