Proposal

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- **Project name**

  Stock Price Prediction Using AI

- **Project background**

  Among various types of data, time series data, in particular, is deeply intertwined with our lives in flow of time. Data obtained from finance, weather, social media, electricity consumption, and more, are all forms of time series data closely associated with our daily existence. However, I have recognized a deficiency in my experience with time series data analysis.

  Therefore, since last year, I have been gradually learning techniques for analyzing and predicting time series data. My aim is to strengthen my understanding by applying the theoretical models I've learned to practical situations. To achieve this goal, I decided to conduct experiments using one of the typical forms of time series data, stock market data. Through this experimentation, I intend to compare the prediction performance of the models I have studied.

- **Project motivations**

  There are several reasons why stock price prediction is necessary. Predicting stock prices can assist in forecasting the flow of financial markets and in the development of financial strategies. Also, it can be of great help to individual investors in making investment decisions and evaluating the value of companies. For these reasons, I believe that undertaking a stock price prediction project is necessary for the better financial economy.

  Furthermore, I think this project is an opportunity to think about what research should be done to more accurately predict stock data with many variables and uncertain future. Therefore, I chose stock data as the topic for my AI project.

- **Dataset for this project**

  S&P500; American Stock Price Data
  I will do data mining at Alpha360 or WSDM23.

- **Models (Papers)**

  - Dlinear

    Are Transformers Effective for Time Series Forecasting?

  - Pyraformer

    Low-Complexity Pyramidal Attention for Long-Range Time Series Modeling and Forecasting

  - ESTIMATE

    Efficient Integration of Multi-Order Dynamics and Internal Dynamics in Stock Movement Prediction

  - PatchTST (SOTA)

    A Time Series is Worth 64 Words: Long-term Forecasting with Transformers

- **Evaluation Metrics**

  MSE, RMSE, RankIR, RankIC

- **Expected results**

  The result of the project will be able to predict and determine whether the stock will rise or fall, rather than predicting the exact figure of how much the stock has risen and fallen. If the project produces successful results, individual investors, companies, and financial institutions related to the economy will be interested in this project result. I think our economic situation can be predicted to some extent through the predicted stock price.