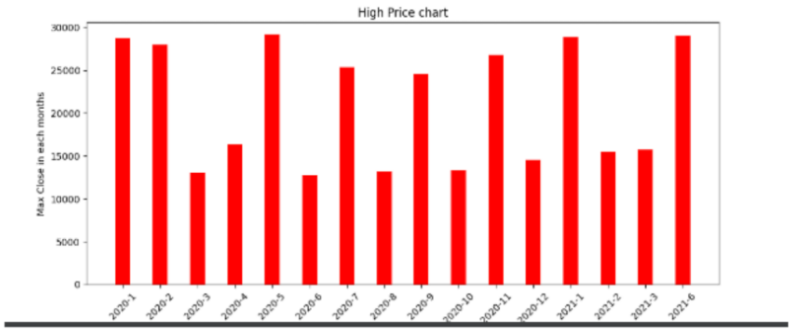
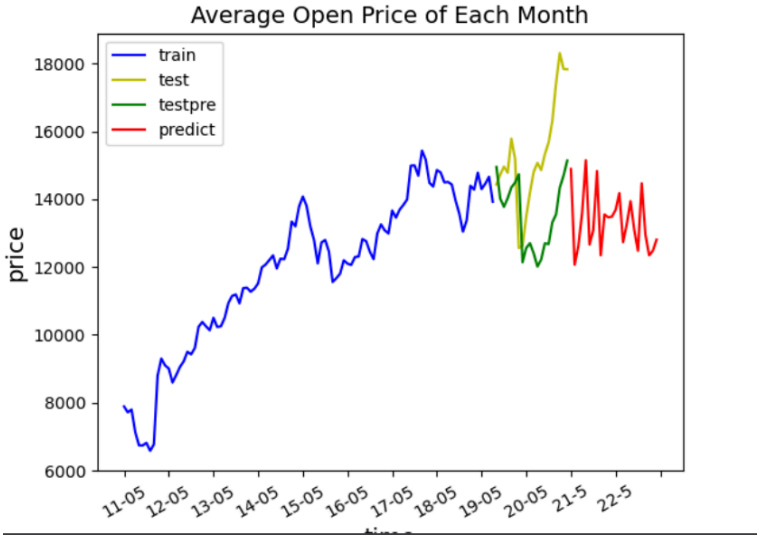
(i)Stock Price Market Analysis

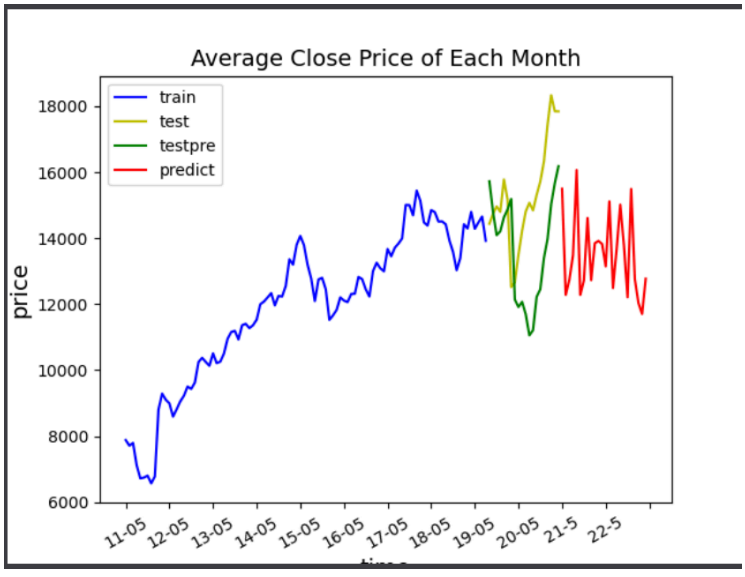
(ii)
Highest market price



Average opening price per month for the last ten years



Average closing price per month for the last ten years



(iii)

Highest market price:

In the chart we can see that the X-axis represents each month for the last two years and the Y-axis represents the highest closing price for each month. So we can derive the highest closing price for each month to derive the analysis.

Average opening price per month for the last ten years:

In this visualization we make predictions based on the last decade of data where the blue line represents the original training data. The yellow line represents the test comparison data, which is also the real data. The green line represents the test data from the model trained on the blue training data. Then we compare the yellow and green lines and find that the fit between the two is more accurate. Therefore, we can make subsequent prediction data and thus the red line represents the prediction data for the future. The X-axis represents the time of the year and the Y-axis represents the average opening price per month.

Average closing price per month for the last ten years:

This chart expresses the same thing as the previous chart. It is also trained using the blue training data. The yellow and green data are used for comparison to determine the level of fit. The final red line represents the predicted data. The X-axis represents the last ten years of data, and the Y-axis represents the closing price.

(iv)

I chose this data set so that I could have a forecast for the future based on the past ten years as much as possible. In the first chart I have studied the highest closed prices for each month over the last year and a half. I think this price is very informative. The closing price has a key role in the next day's trend or the current week's trend. So I will choose this data to study. This data gives me a basic judgment of the recent stock market.

The data presented in the first chart gave me a direction for my research. At the same time, I realized that this one piece of data was not enough to meet my requirements to analyze the overall trend. So I chose to expand the amount of data for a deeper analysis. I used the opening and closing prices from the last decade to ensure the accuracy of the data predictions. I also changed the method of taking the highest value to the average to improve the accuracy of the forecast. The charts that I have created from my analysis show that the stock market has been steadily improving over the last decade, which means that the economy is doing very well. I also found that the opening and closing prices reached a small peak in 15 and 18 years, which is a very good wave. And in my opinion this is an economic cycle. Every three years or so there is a good wave of the market. So after 18 years we see a peak in 21 years as well. This allows us to analyze that we can invest according to such an economic cycle.

(v)

At the beginning of my analysis I talked about data import. But because the data is too large so there will be some missing data. So I need to normalize and normalize the data. Then I created the training set and validation set. I also used a fitted LSTM network to prepare the model for subsequent prediction. After we filtered the data for the last decade, I needed to rearrange the disordered time and convert the time in the CSV data. I used the Tensorflow open source machine learning framework for future data prediction.

(vi)

First of all, I think choosing the finance field is a direction of interest for me. I really like working with data trends. I think it's very meaningful because the finance field is also related to the development of our daily life. In this process, although the predictions are not always accurate, I think the trends I analyze can give people an idea. There are cycles in the economy. This can then be used as an investment idea. People who are in an economic cycle must understand that the highs and lows are not easy to make decisions. And there should be patience not to rush, as I analyzed in recent years are three years for a cycle. Investors should be as patient as possible waiting for the peaks to avoid the troughs. As much as possible to ensure that their investment interests are maximized.

GitHub Link：https://github.com/icesylh/2415Donghan-Li-MidFianlProject.git