Abstract Section:

The main research problem here is how we are using python and other algorithms for Stock predictions. In this project, we are trying to write code using any company and predicting its values/prices. The context of this problem is to build a code to predict stocks as when there is a person manually working on stocks it could take him time and the stock price could change in a matter of seconds. We aim to use the code we built and that system for stocks so we can invest for the best price possible. The overall approach to answer is to use various algorithms in the code and predict stocks. We can use methods such as linear models and neural networks. These two are really important approaches for predicting future stocks as the results can most likely be accurate. Overall in the code linear approach was used for my results as it is accurate and involved the average of the 3 days to predict. Predicted an algorithm for Tesla; values from the code. The actual price was 22.83 and I predicted 23.23. The values consisted of the past 3 days which were 23.32, 22.65, and 22.79 based on these results the program was able to give me an actual price and a prediction of the future. As shown above it's known that the prediction was accurate as the prediction was close to the actual price. The difference between both of them was 0.4% which shows my way of approach is appropriate to use. In conclusion, the values were precise as the actual price was 22.83 and the predicted was 23.23. Even though there could be other approaches to use for this code I believe the linear model will be the best.

Background:

During the phase of working on the code, I used multiple approaches such as using past values to predict the ones in the future. This approach involved pattern and precision as it worked most of the time. I used this approach in my problem as a linear model which consisted of an average of the last 3 days and a neural network. These were two of the approaches I learned and used in our research. Especially the linear model, I used this for my results as there are values from the past 3 days and used that data to predict the future. Using a Linear model can be really useful as your data can have a pattern and the results could be accurate most of the time. Linear regression performs exceptionally well for linearly separable data and is easier to implement, interpret, and efficient to train. There could also be some cons to using the linear model as the assumption of linearity between dependent and independent variables.

Dataset:

As I am working on the stock prices, I split them into testing and training and I used the values from the last 3 days. I am downloading the data from yfinance, and I used python as the language. Since I split my code into testing and training I used this not to overfit. The main idea of splitting the dataset into a validation set is to prevent our model from overfitting i.e., the model becomes really good at classifying the samples in the training set but cannot generalize and make accurate classifications on the data it has not seen before. The train-test split procedure is used to estimate the performance of machine learning algorithms when they are used to make predictions on data not used to train the model. It is a fast and easy procedure to perform, the results of which allow you to compare the performance of machine learning algorithms for your predictive modeling problem. In the training the input element of the dataset is provided to the model, then predictions are made and compared to the expected values. In the testing, the objective is to estimate the performance of the machine learning model on new data: data not used to train the model. This proves that splitting them both can be crucial as if you do overfit it can be a conflict with your code.

Methodology/Models:

In my project, I used two different methods, the linear model and the neural network. These two were a big part of my project as they involved a pattern for my values while predicting future stocks. The linear model basically uses the relationship between the data points to draw a straight line through all of them. This line can be used to predict future values. In Machine Learning, predicting the future is very important. Since I used this method I got a good set of results, 3 days of past results and it was able to predict the future based on the results from the past values. This shows that the approach of the linear model is really important as there would be a certain pattern for your results unlike just getting random values. Another approach I used in this research is neural networks. They are computing systems with interconnected nodes that work much like neurons in the human brain. Using algorithms, they can recognize hidden patterns and correlations in raw data, cluster and classify them, and continuously learn and improve. This took place in my code as they analyze price data and uncover opportunities. Using neural network, you can make a trade decision based on thoroughly examined data. This is not necessarily the case when using traditional technical analysis methods. The ability to learn and model non-linear and complex relationships is really important because in real-life, many of the relationships between inputs and outputs are non-linear as well as complex. Overall these two approaches were really accurate and useful as they consisted of good end prediction.

Results and Discussion:

In my research, there were many highlights due to the approaches I used and they were my results. The prediction was the main highlight as it was actually able to predict a precise value compared to the actual price. Coming to the results, it consisted of 3 days' prices of the Tesla and was able to take the average to predict. This approach was the linear model as I explained above in methodology/models. The hyperparameters used for this task had to do with the Neural Network Architecture and other parameters like the learning rate used for the training phase. Hyperparameters did take a big role in my research and provided a good result. Even though I used a linear model and neural networks there could still be some flaws in my project as something could've gone wrong while working on the code. There could be an error with the value that was used in the data, or maybe a human error and accidentally using a different number in the wrong spot. There could be many mistakes that could've happened with my results and that would depend on the percent of error. There could also be some errors with a neural network such as having big discontinuities in the data space, or large clusters of separated data is going to make the learning process much more difficult. usually require much more data than traditional machine learning algorithms, as in at least thousands if not millions of labeled samples. This isn't an easy problem to deal with and many machine learning problems can be solved well with less data if you use other algorithms.

Conclusion:

In conclusion, I believe this research project was a success and I reached my goal because many things went as I expected. I am satisfied with my work and the effort I am involved in the project. There were many key points to highlight in this research such as the two approaches linear model and neural networks. These two approaches were really useful and involved a great pattern throughout my code. In my results, my prediction I believe was also accurate as my prediction was close to the actual price. There were things I did well and poor, I used the two approaches mentioned above and involved a lot of effort to work on the research. There were also things I did badly which are, not asking about some parts of the code which didn’t help me understand how that worked. In the end, I believe this was really good research and I gained a lot of experience from this project. Hopefully, I will be able to use this knowledge in future projects and apply it to practical problems.