Capstone Project – Investment Portfolio optimizer

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Business Objective

- To help the average investor build a portfolio of stock and ensure maximum returns.

- The assumption here is that the investor already has an idea of the companies he/she wants to invest in. The aim here is to provide the investor the tools to make the final decision whether to invest or not. There will be no recommendations or financial advice given to the investor.

- Focus will also be on diversification i.e. by investing in different sectors, investors can reduce their risk and get better returns rather than just betting on the next unicorn.

Data Collection

yfinance

yfinance 0.2.17

`pip install yfinance`

Download market data from Yahoo! Finance API

yahoofinancials

yahoofinancials 1.14

`pip install yahoofinancials`

A powerful financial data module used for pulling both fundamental and technical data from Yahoo Finance
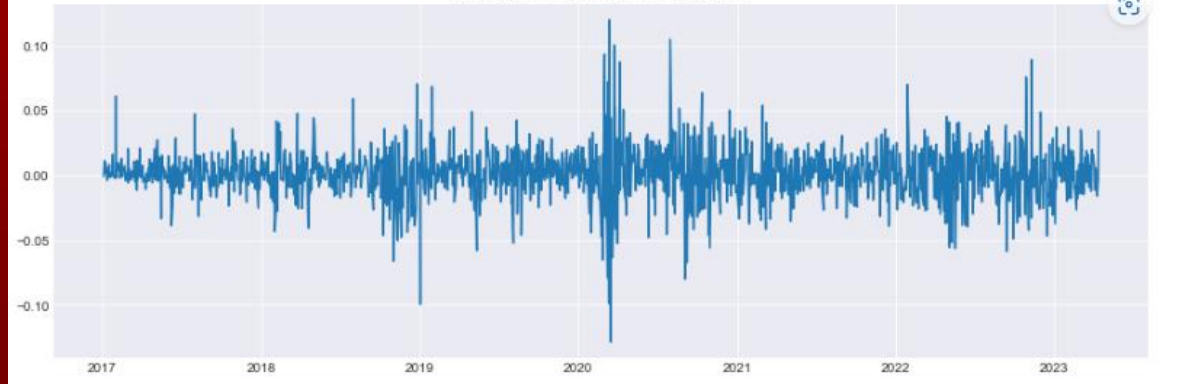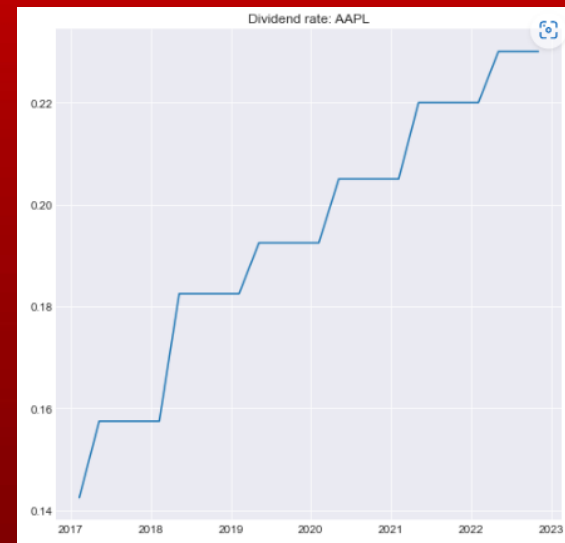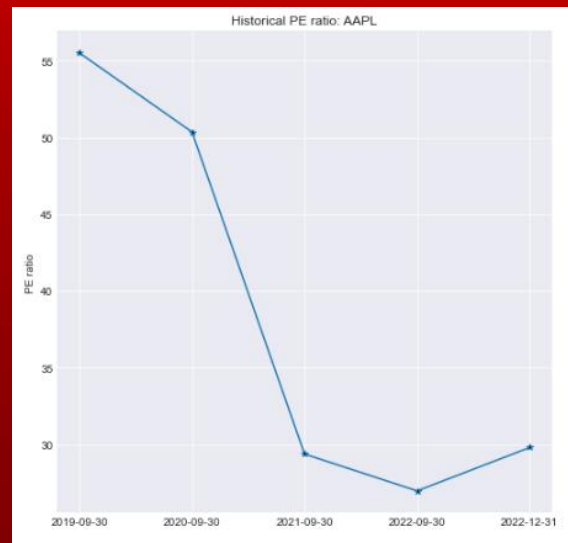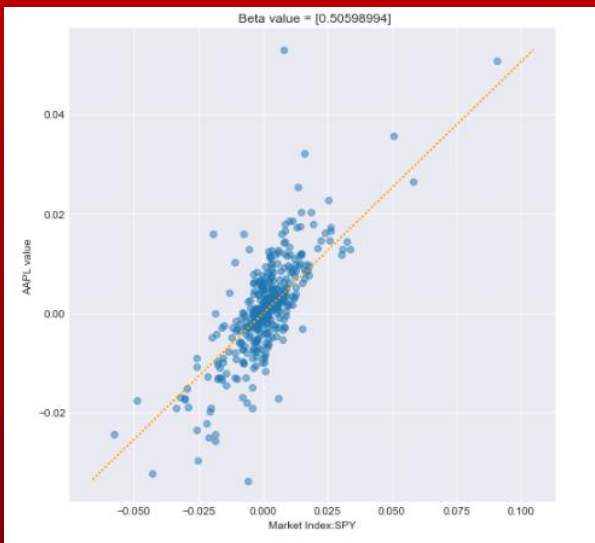
Stock Price of AAPL from 2017 till date

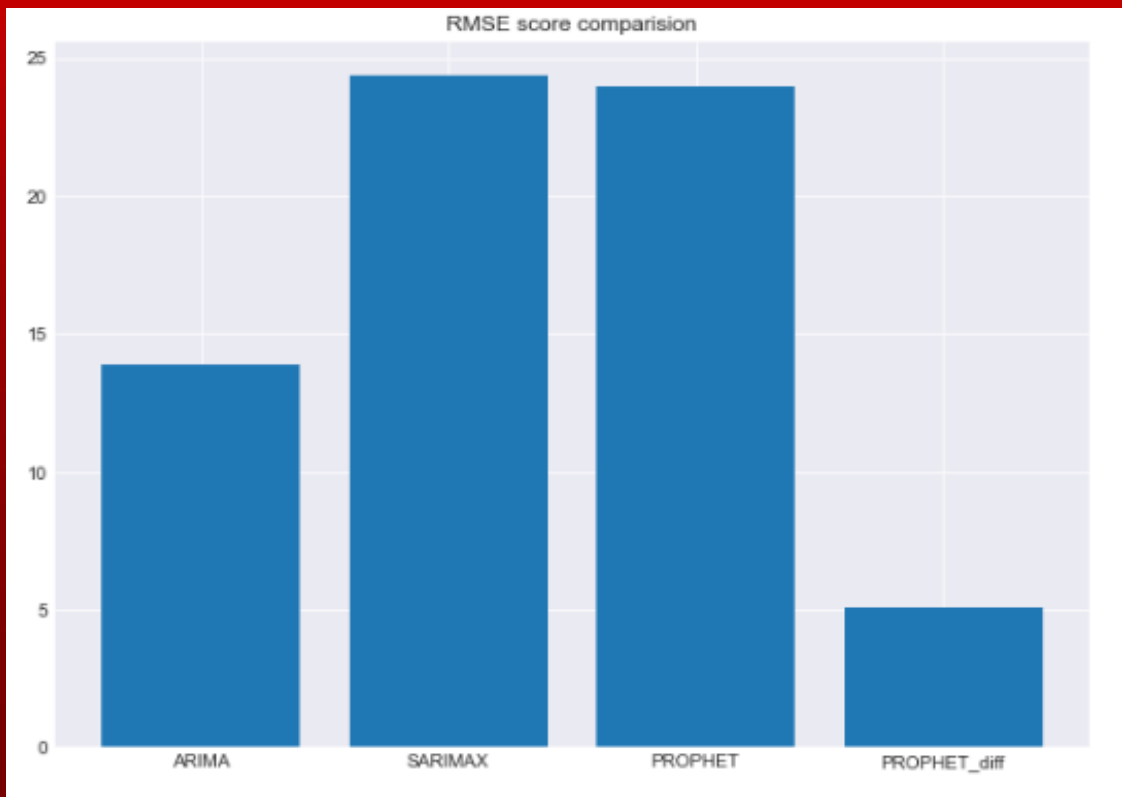Stock Return Pct from 2017 till date: AAPL

Beta value = [0.50598994]

Historical PE ratio: AAPL

Dividend rate: AAPL

RMSE score comparision

Predicted performance of AAPL
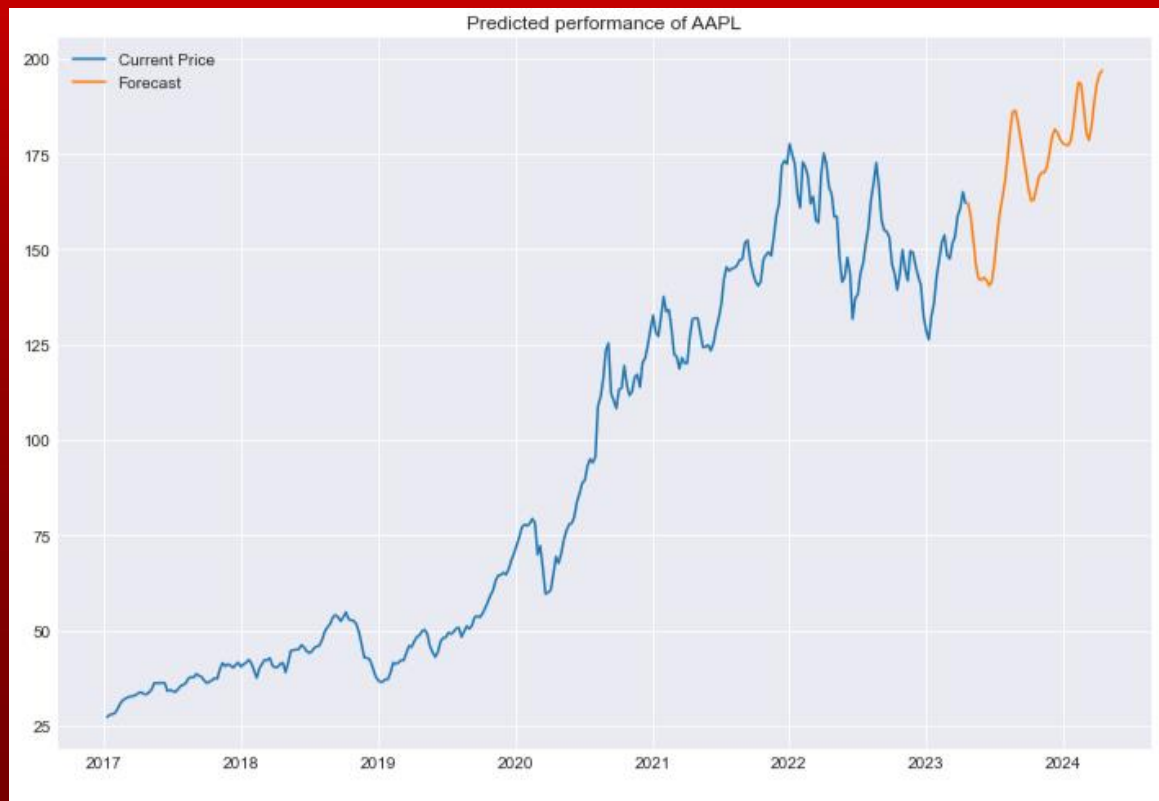
Diversify! Diversify! Diversify!

```
# Tesla,General Motors and Ford
portfolio(1000,['TSLA','GM','F'])

[*********************100%*********************]
[*********************100%*********************]
Current price of TSLA is 185.0
Forecast price of TSLA is 97.81
[*********************100%*********************]
[*********************100%*********************]
Current price of GM is 34.4
Forecast price of GM is 34.64
[*********************100%*********************]
[*********************100%*********************]
Current price of F is 12.48
Forecast price of F is 14.8


Amount invested in each stock: $333.33
Cumulative returns: -5.78%
```

```
#General Motors, Apple, Pfizer
portfolio(1000,['GM','AAPL','PFE'])

[*********************100%*********************]
[*********************100%*********************]
Current price of GM is 34.35
Forecast price of GM is 34.36
[*********************100%*********************]
[*********************100%*********************]
Current price of AAPL is 164.7
Forecast price of AAPL is 196.41
[*********************100%*********************]
[*********************100%*********************]
Current price of PFE is 41.03
Forecast price of PFE is 44.43


Amount invested in each stock: $333.33
Cumulative returns: 9.1%
```

```
# very little investment
portfolio(50,['GM','AAPL','PFE'])

[*********************100%*********************]
[*********************100%*********************]
Current price of GM is 34.38
Forecast price of GM is 34.33
[*********************100%*********************]
[*********************100%*********************]
Current price of AAPL is 164.96
Forecast price of AAPL is 196.97
[*********************100%*********************]
[*********************100%*********************]
Current price of PFE is 41.06
Forecast price of PFE is 44.53


Amount invested in each stock: $16.67
Investment is too low
Please pick a different stock or increase investment
```

Conclusions

Limitations:

1. All the models are purely mathematical models and cannot take into account black swan events.

2. More sophisticated models using Deep Learning can be built to get more accurate forecasts.

3. Dividend data is not incorporated while calculating overall returns.

4. Currently, the invested amount is distributed equally amongst all the stocks. The amounts can be tuned based on the investor's appetite for risk.

Recommendations:

1. By plugging in amounts and companies in the model, the investor can play around and maximize his/her returns.

2. Looking at the stock market in general, there was a drastic spike around 2020. There has not been a decline to pre-2020 levels and hence, it might be prudent to collect past data only from 2020 onwards rather than from all the way back to 2017.

Thank You!