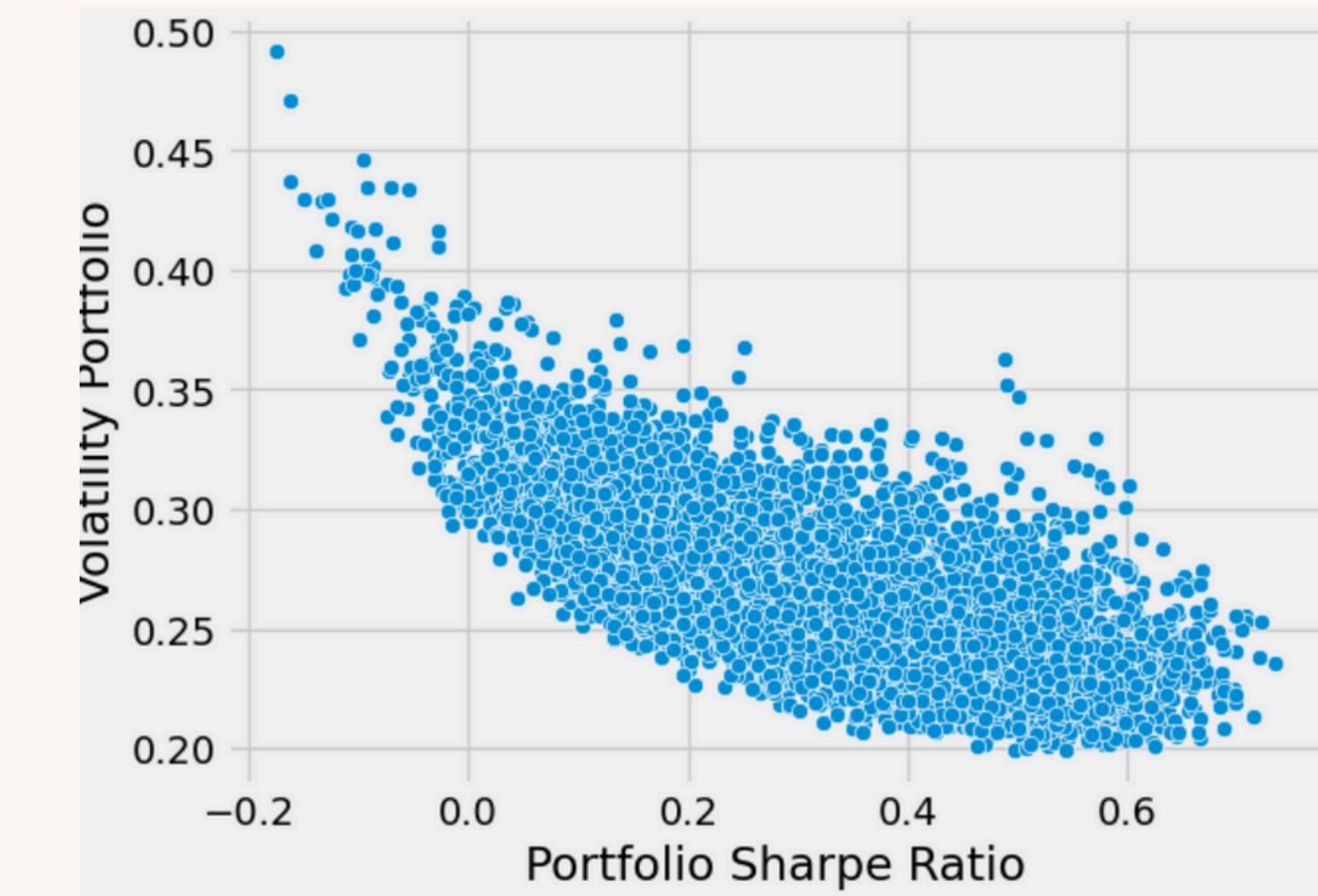


Monte Carlo Simulation

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The stocks considered are Tata, Wipro, Yes Bank, Reliance & JSW



Methodology Used



The Monte Carlo simulation method here is used to calculate the best return that a portfolio distribution could get considering a particular risk that can be taken by an investor (suppose me)

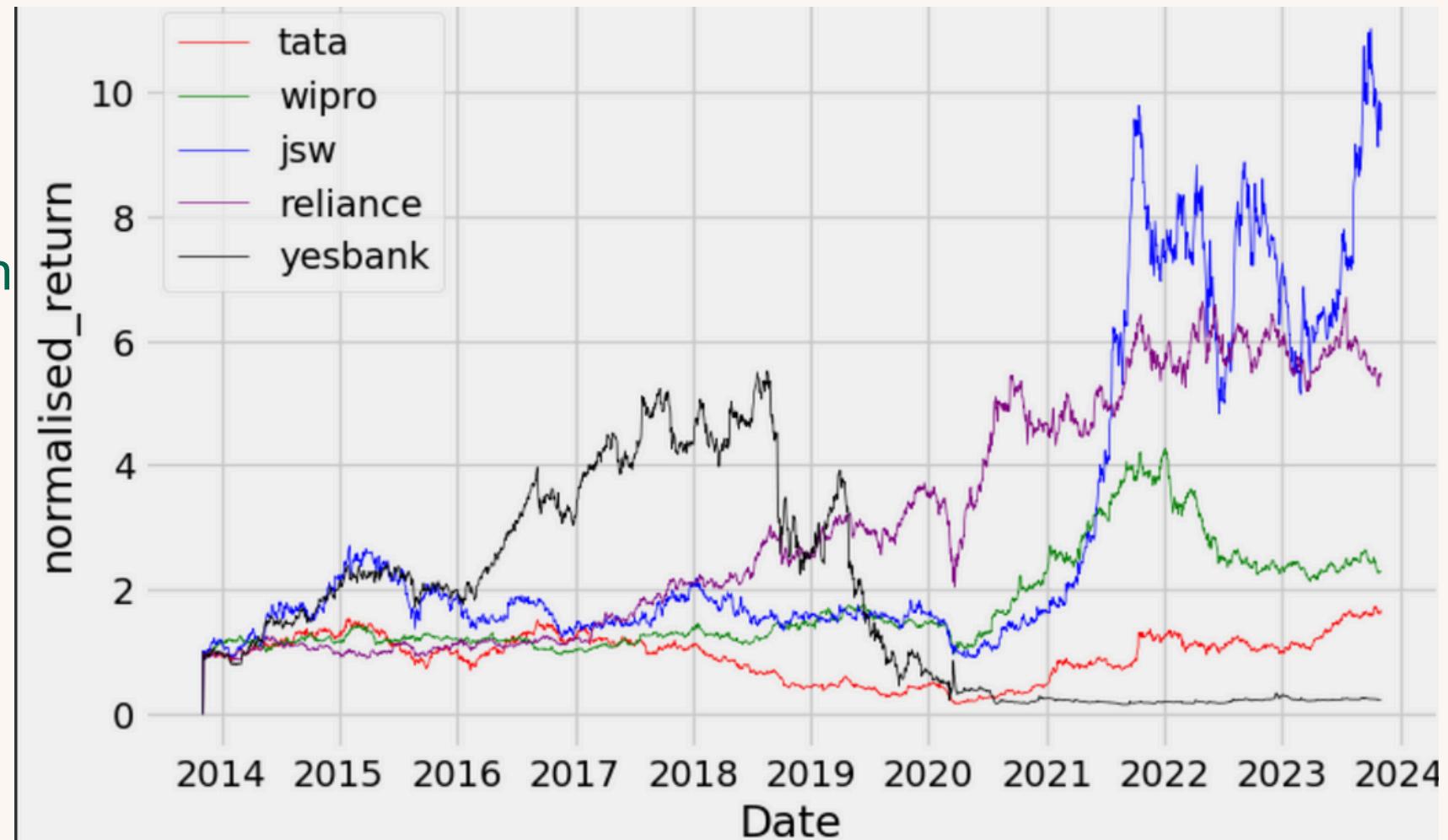
How did I proceed?

First, i started by using the concept of returns generated by a stock over a span of time.

The `.pct_change()` gave percentage change of stock prices after each day.

I randomly initialised some percentage of money that each stock in my portfolio would get bys using `np.random.random()` and calculated the normalised return of each stock

After randomly getting weights of portfolio, each return could be estimated



The normalized returns and the random weights were then used by me to find the Sharpe Ratio for the portfolio
The volatility meant- how much the stock varied with a small change in the market

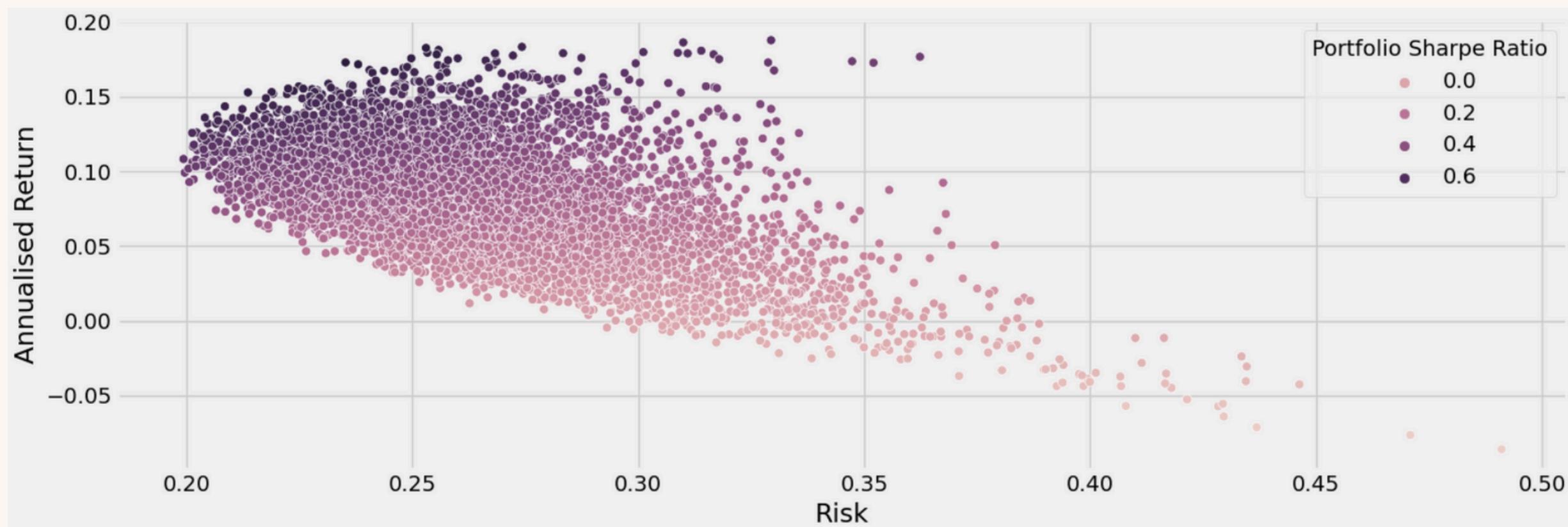
High volatility meant greater risk involved for the investment.

Sharpe Ratio indicates the risk-adjusted return

Then, I ran the model for 7000 iterations to identify the investment with highest Sharpe Ratio and Minimum Volatility i.e. Risk.

```
▶ print("The MAX SHARPE RATIO is-")
print("-"*60)
print(max_sharpe_ratio)
print("-"*60)
print("The MIN Volatility Ratio is ")
print("-"*60)
print(min_volatility)

[265] The MAX SHARPE RATIO is-
-----
Portfolio Return      0.172828
Volatility Portfolio  0.235213
Portfolio Sharpe Ratio  0.734773
Name: 2521, dtype: float64
-----
The MIN Volatility Ratio is
-----
Portfolio Return      0.108236
Volatility Portfolio  0.199361
Portfolio Sharpe Ratio  0.542914
Name: 6414, dtype: float64
[265] print("The portfolio distribution for max sharpe ratio at a risk of ")
```



Insights and Summary

Although, the project has achieved the required deliverables still the project done by me could have a lot of improvements :

- Use of optimization tools to further optimize the simulation's accuracy
- Use of more stocks for better understanding of what investment actually looks like
- Not considering the Risk free rate for calculation of sharpe ratio

This was my first time trying data visualisation and algorithm coding for a financial related task. The project got me interested in the possibilities of implementing a solid strategy for different kind of trading firms

Though the project was very basic and beginner friendly i learnt more than what was required.

If i might have unknowingly missed some deliverables, i would try to send them when asked for.