Visualizing Stock's Performance

Ansh Ruhela

In this project, I have analyzed and visualized the performance of some specific stocks across different sectors listed on NSE, India over the time period of first six months of 2022.

- ITC.NS
- MCDOWELL-N.NS
- RTNINDIA.NS
- SCHAND.NS
- TATAPOWER.NS
- YESBANK.NS

I have used python libraries such as Pandas, pandas_datareader and Matplotlib to fetch, tabulate and visualize the data for each of the stocks. I took a visual look into the similarities and differences between these stocks during the six month period from January through June 2022 by performing the following procedure.

1. Visualizing the stock prices using matplotlib
2. Calculating and visualizing the daily simple rate of return
3. Calculating and visualizing the mean rates of return
4. Calculating and visualizing the variances of the returns
5. Calculating and visualizing the standard deviations of the returns
6. Writing a short thesis based on the correlations between the tech stocks

Step 1 : Importing packages

1. **Import Data Manipulation Packages-** Import the pandas and numpy module as `pd` and `np`, respectively
2. **Import Financial Package-** Import the pandas data reader module as `web`
3. **Import Visualization Package-**Import the matplotlib `pyplot` module as `plt`.

Step 2: Loading the adjusted closings of the stocks

This step includes the defining of the specific stocks with the dates to be considered for performance check. Afterwards, retrieving the data and viewing it in organized form.

1. Creating a list named `y_symbols` containing the symbols for specific chosen stocks.
2. Creating a datetime object representing January 1st, 2022 named `startdate` and a datetime object representing July 1st, 2022 named `enddate`.
3. Calling the function `web.get_data_yahoo()` with arguments `y_symbols`, `startdate` and `enddate` and save the result to `stockdata`.
4. Viewing both `stockdata` and `stockdata['Adj Close']`

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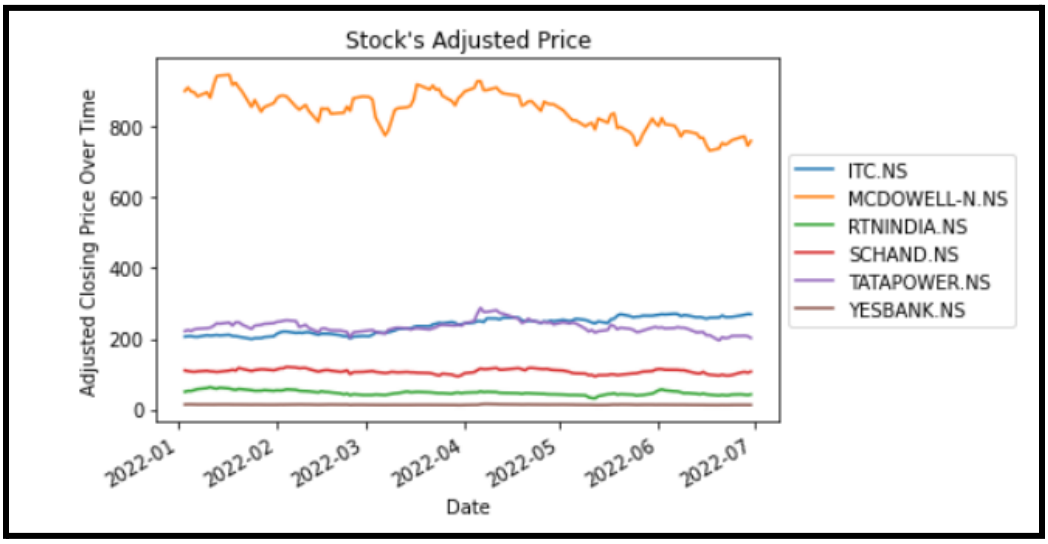
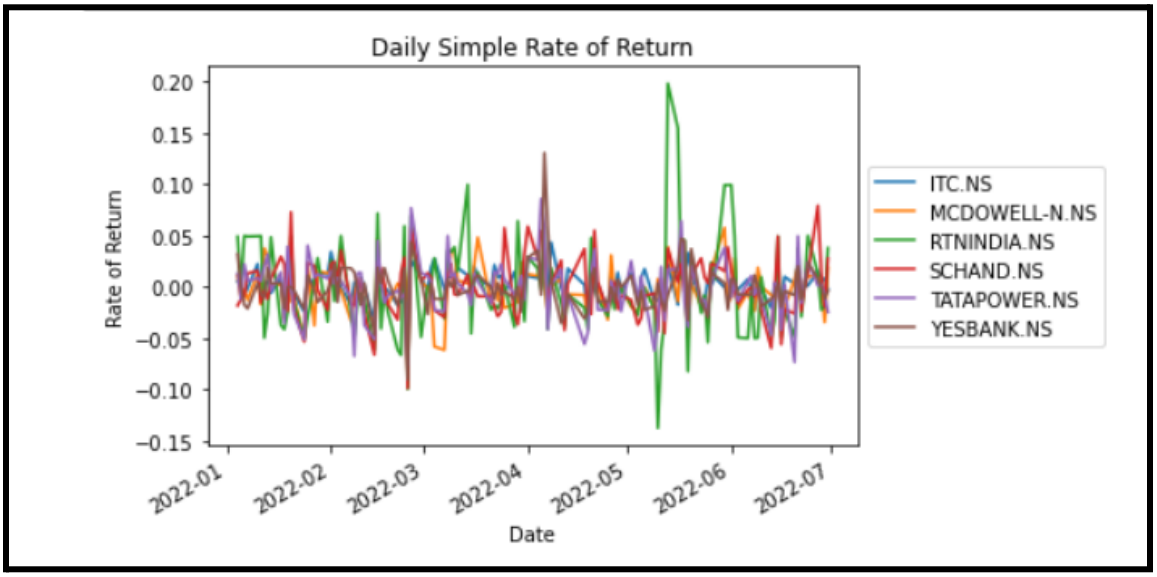
Step 3: Plotting the adjusted closing prices overtime.

Creating a plot with matplotlib that shows the adjusted closing prices of each stock over time. I have Set the x label to "Date" and the y label to "Adjusted Closing Price Over Time" ; the graph title to "Stock's Adjusted Price".



Step 4: Calculating and plotting the daily simple rate of return over time.



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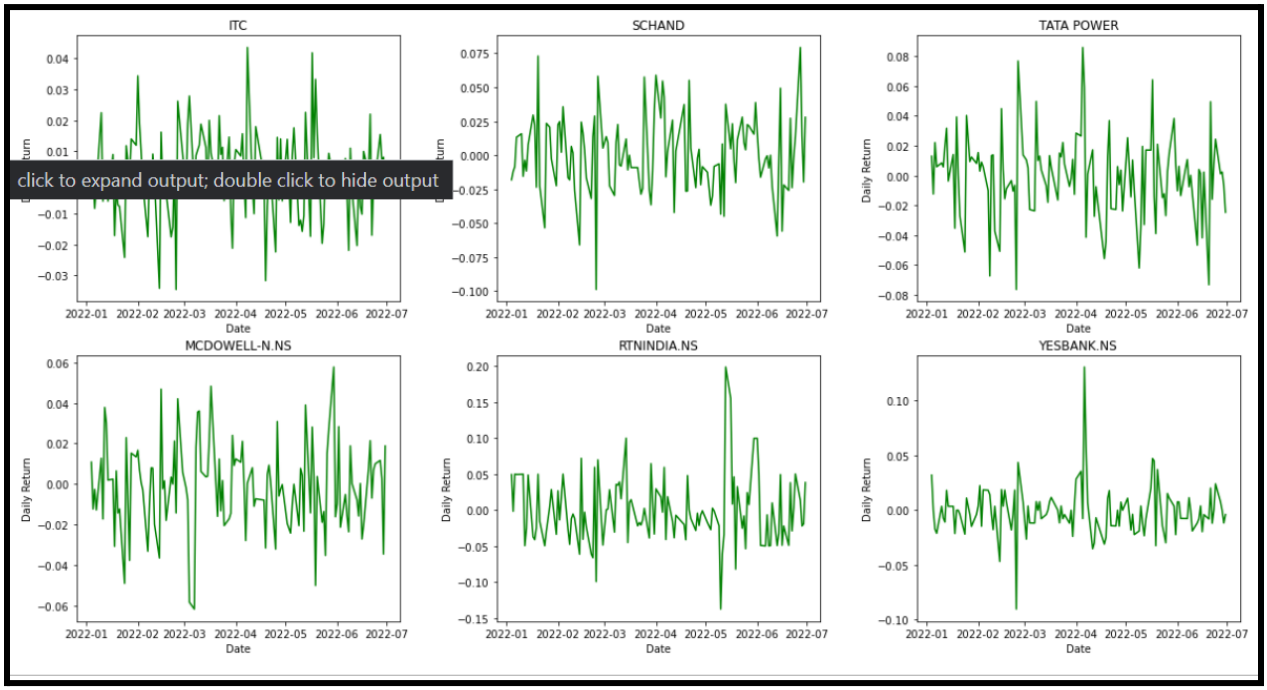
Step 5: Creating subplots of daily simple rate of return

In order to visualize the daily returns, I have created a subplot for each stock.



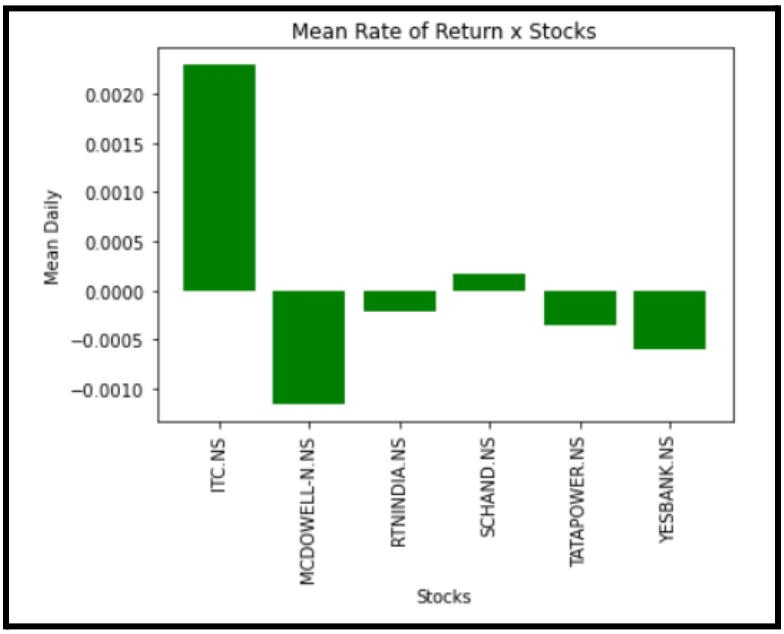
Step 6: Calculating and plotting the mean of each stock's daily simple rate of return

1. **Calculate mean rate of return-** For each stock, calculated the mean daily simple rate of return.
2. **Plotting the bar chart-** Using the matplotlib to create a bar chart, comparing the mean daily simple rate of return for each stock.
3. **Analyzing the mean rate of return**- Based on the mean rate of return, which stock would be the best option to invest in?

```
Out[167]: ITC.NS          0.002301
          MCDOWELL-N.NS  -0.001157
          RTNINDIA.NS    -0.000216
          SCHAND.NS       0.000166
          TATAPOWER.NS   -0.000360
          YESBANK.NS     -0.000604
          dtype: float64
```

ITC.NS has the highest mean simple rate of return over the period of data collected. Thus ITC.NS would have been a good choice for investment over this period of time. MCDOWELL.NS , on the other hand, has the lowest mean simple rate of return over the period.

- I have also plotted the bar chart for the above data which clearly shows that ITC.NS has the highest mean return rate, therefore it was the best option to invest.



- On the other hand, **MCDOWELL.NS** has the lowest mean rate of return and hence, it is the wealth destroyer for the given period of the time.

Step 7: Calculating and plotting the variance.

1. **Calculate the variance-** For each stock, calculated the variance of the mean daily simple rate of return.
2. **Plot bar chart-** Used matplotlib to create a bar chart comparing the variance for each stock
3. **Analyse the variance-** Considering the stocks are being analyzed individually, ITC.NS is the riskiest one due to its highest variance.

Considering the stocks are being analyzed individually, ITC.NS is the riskiest one due to its highest variance. (figure on next page**)**

- **ITC.NS shows the highest variance of all the stocks, indicating it can be a riskier investment. SCHAND.NS shows the lowest variance, indicating that the returns are more predictable. This goes along with the typical understanding of higher return, high risks stocks, and lower return, low risk stocks.**

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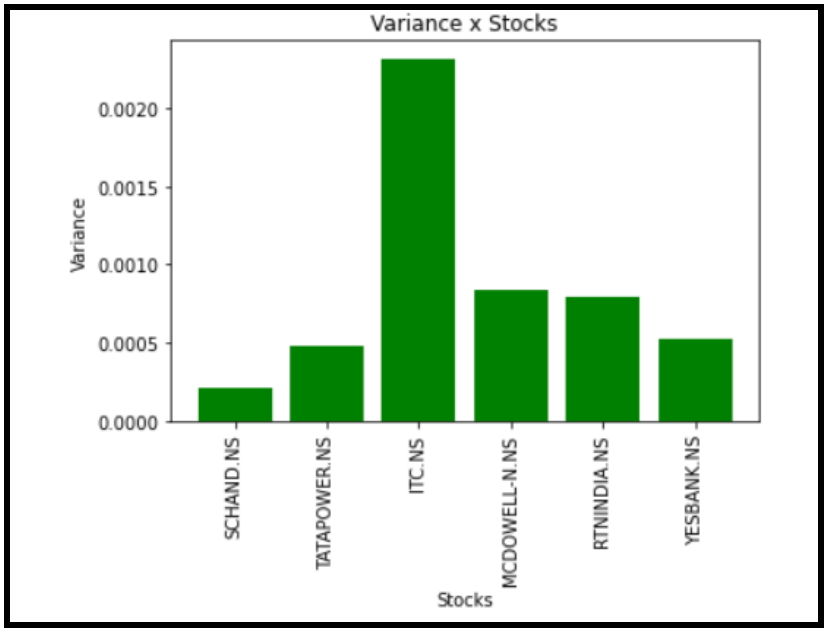

Step 8 :Calculating and plotting the standard deviation

1. **Calculated the standard deviation-** For each stock, calculate the standard deviation of the mean daily simple rate of return.
2. **Plot the bar chart-** Use matplotlib to create a bar chart comparing the standard deviation of the mean daily simple rate of return of each stock.
3. **Analyze the standard deviation-**

Based on the standard deviation of the rates of return, which stock would you choose to invest in and why?

I would choose a stock to invest according to my investor profile. If I'd rather take more risk, I would invest in ITC.NS stocks because it brings more return.

On the other hand, if I was risk-averse, I would invest in Microsoft stocks because SCHAND.NS brings a good return with less risk.

The answer to this question depends on your investment preferences. ITC.NS is the most volatile stock, as it has the largest standard deviation. It also, however, has the largest mean return. If you are a more risky investor, this could be your stock of choice. SCHAND.NS, on the other hand, is the least volatile stock, but has decent mean return.

Step 9: Calculating the correlations

- Calculated the correlations between each of the stocks.

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Which stocks are positively correlated? Which are negatively correlated? Which have little correlation?

:

	ITC.NS	MCDOWELL-N.NS	RTNINDIA.NS	SCHAND.NS	TATAPOWER.NS	YESBANK.NS
ITC.NS	1.000000	0.390590	0.299418	0.376586	0.479439	0.326436
MCDOWELL-N.NS	0.390590	1.000000	0.369564	0.394278	0.573271	0.323396
RTNINDIA.NS	0.299418	0.369564	1.000000	0.473430	0.454531	0.352864
SCHAND.NS	0.376586	0.394278	0.473430	1.000000	0.538018	0.412559
TATAPOWER.NS	0.479439	0.573271	0.454531	0.538018	1.000000	0.488801
YESBANK.NS	0.326436	0.323396	0.352864	0.412559	0.488801	1.000000

- None of the stocks are negatively correlated. TATAPOWER.NS and MCDOWELL.NS are highly correlated, while RTNINDIA.NS and ITC.NS exhibit the lowest correlation.