

Finance and Risk Analytics Capstone

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The problem

Company

Provide consultation to two different investors, Mr. Patrick Jyenger and Mr. Peter Jyenger based on their requirements and financial objectives.

Context

- Your role requires you to analyze a portfolio of stocks to provide consultation on investment management based on client requirements.

Conservative

Mr. Patrick Jyenger

Wants to maintain a decent standard of living post his retirement.

Has always been a conservative investor during his life

Available capital of \$1 million; Wants to invest \$500K in a magazine (Naturu) for minority stake and remaining \$500K in equities

Expects doubling his capital with less risk in 5 years' time to buy a minority portion of Naturu

Aggressive

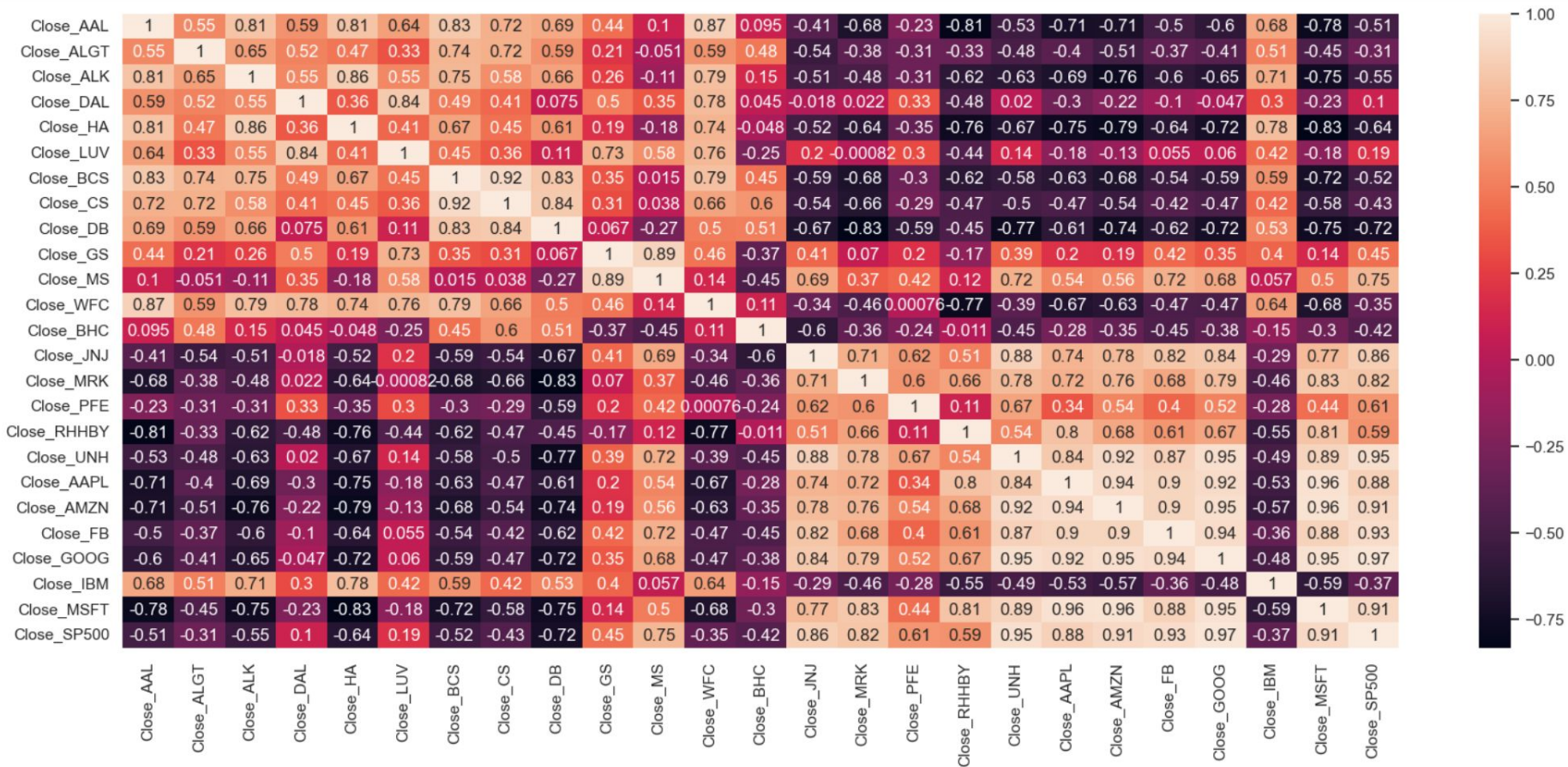
Mr. Peter Jyenger

Consistent with his attitude towards risk, he prefers high-return investments

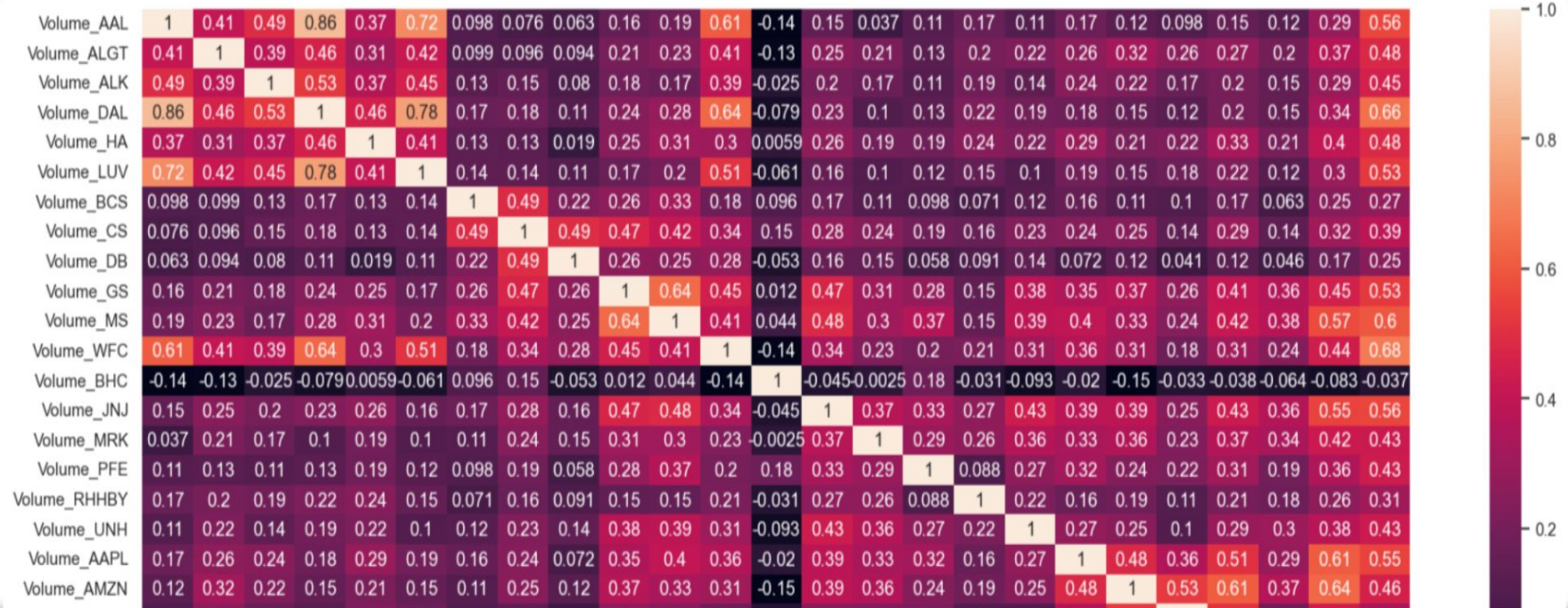
Believes that he can still bounce back in case of any occasional losses

Wants to invest \$1 million from company's cash and cash equivalents in the most high-margin stocks

Expects high returns within 5 years for inorganic expansion of JWW

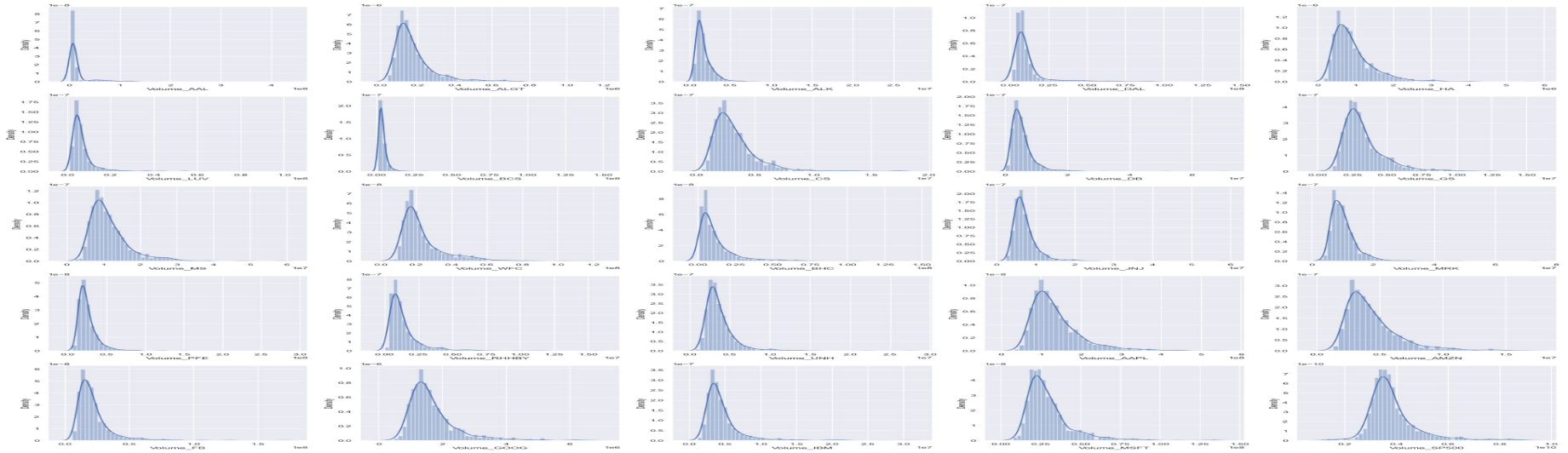


Strong Positive Correlation (0.6 to 1) for the following companies: Apple, Amazon, Google, Goldman Sachs, J&J, and Merck & Co. Hawaiian Holdings, American Airlines, and Alaska Air have Weak Positive Correlations (0 to 0.6). Bausch Health, Credit Suisse, and Deutsche Bank have negative correlations (-0 to -1). Stocks with a negative correlation to the Index (S&P 500) should ideally not be included in a portfolio as they could be exceedingly harmful.

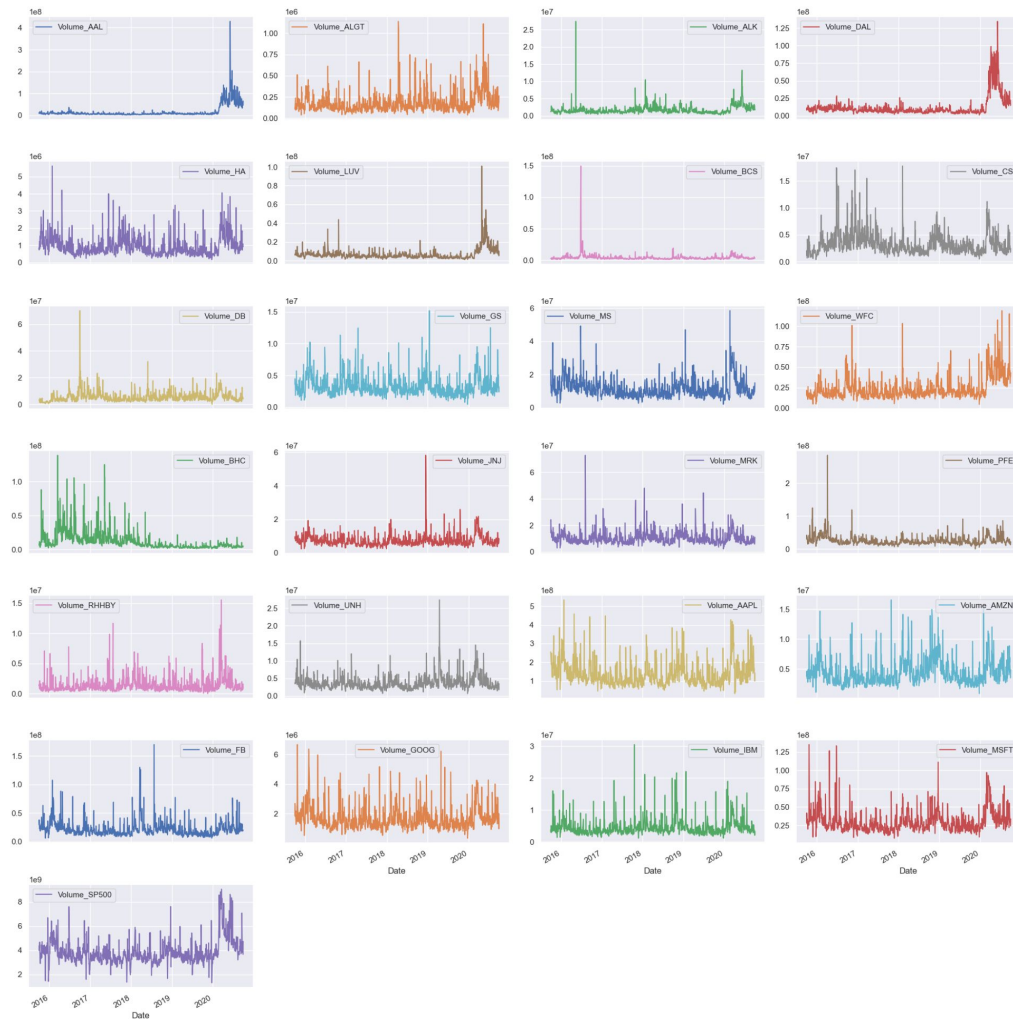


Obervation :¶

S&P500 has a positive correlation with all the stock except with BHC Correlation of more than 0.6 can be observed in the volumes of DAL, WFC, MS, and the highest is with MSFT - 0.71.



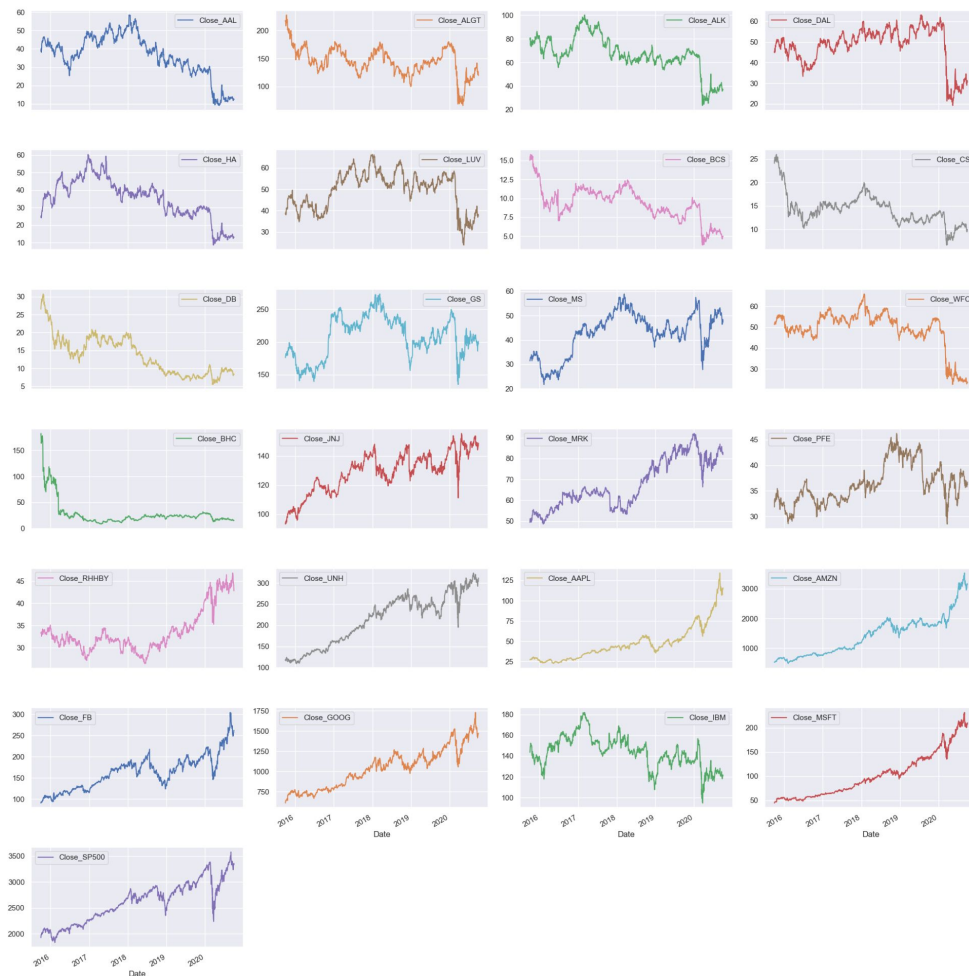
The greater standard deviation there is, the more volatile the stock is. A volatile stock will therefore cover more space in the statistics above. ALGT, DAL, HA, CS, GS, MS, WFC, BHC, RHBY, AAPL, GOOG, and IBM -- These stocks exhibit volatility.



1. AAPL, DAL, LUV ---> the volumes have gone up in 2019-20

2. Trading volumes have gone down in ALK, BCS, DB, BHC, JNJ and PFE.

3. The volume movement in most technology stocks is observed in sync with S&P 500

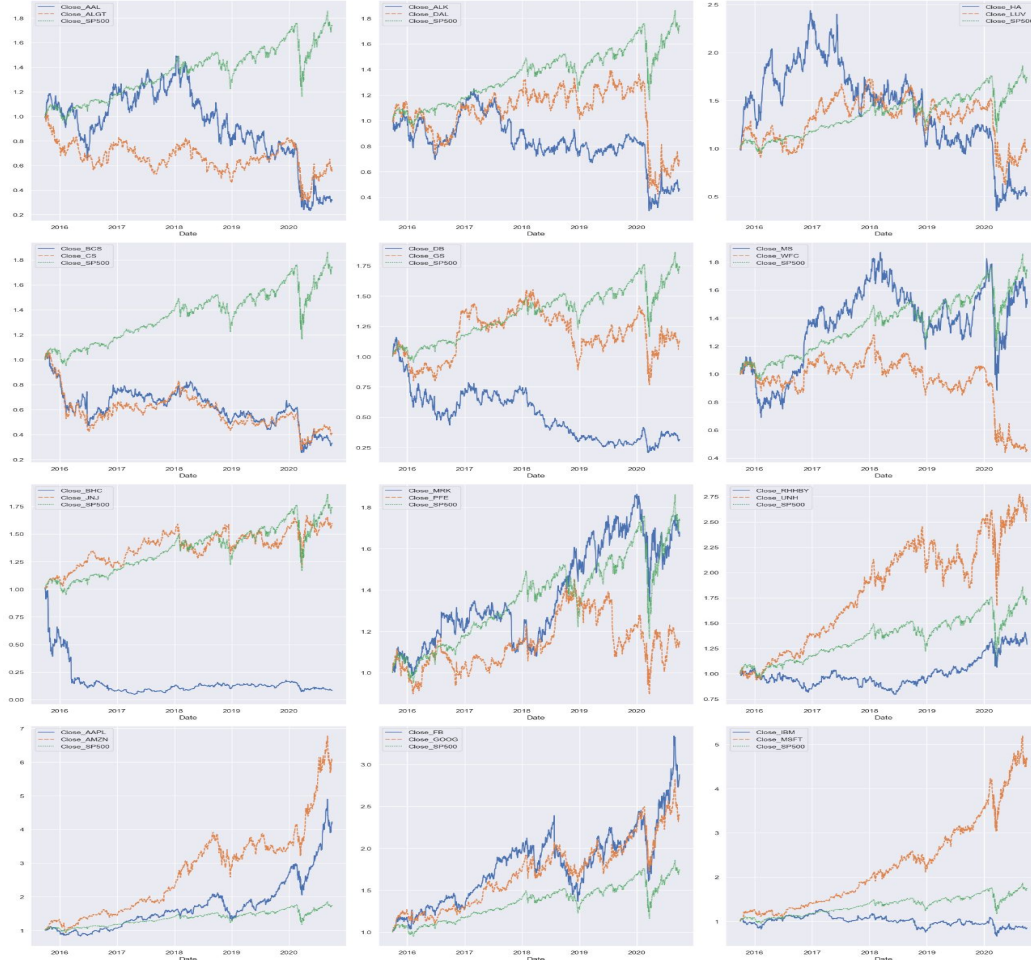


Stocks with positive movement, indicating that the price increased within the specified period, should be taken into consideration. Additionally, it implies that an upward trend in prices is anticipated in the future. Stocks in the banking and aviation industries are now cheaper. In DB and BHC, the prices have decreased the most.

Normalisation:

The stock prices of various stocks here are on different scales. Hence, we need to perform normalisation to have them on the same scale for analysis

After normalization, the values are in the range of -1 to 1. Now we will observe the visualisation of normalised data - as it becomes easier for us to compare the performance.



1. MSFT, GOOG, FB, AAPL, AMZN are showing an uptrend, whereas IBM is showing a downtrend.
2. In healthcare - BHC and PFE are showing a downtrend
3. In Finance - DB, BCS, CS and WFC are showing a downtrend
4. In aviation - HA, DAL, AAL are showing a downtrend.

	Stocks	AnnualizedReturns
0	AAL	-8.519523
1	ALGT	-1.187886
2	ALK	-6.438219
3	DAL	1.067695
4	HA	0.889412
5	LUV	6.215866
6	BCS	-13.797901
7	CS	-11.027504
8	DB	-13.337170
9	GS	7.632114
10	MS	14.587154
11	WFC	-10.456598
12	BHC	-22.585851
13	JNJ	11.348013
14	MRK	12.918506
15	PFE	5.184229
16	RHHBY	7.385723
17	UNH	23.703625
18	AAPL	33.298855
19	AMZN	40.580413
20	FB	26.480032
21	GOOG	21.041399
22	IBM	-0.052083
23	MSFT	34.933450
24	SP500	13.036693

1. All tech stocks have given positive returns except IBM. The highest returns have been given by AMZN followed by MSFT followed by AAPL.
2. Highest negative return was in health care - BHC to the tune of -22%.
3. In healthcare, UNH has given highest positive return - 23%.
4. In Finance, barring GS and MS, all stocks have given negative returns.
5. The lowest positive returns have been observed in Aviation industry - HA at 0.88%, followed by DAL at 1.06%

	Stocks	AnnualizedReturns	AnnualizedRisk	Cumulative_ret	Sharpe_Ratio
19	AMZN	40.580413	30.112837	504.69	1.347363
23	MSFT	34.933450	27.843398	371.49	1.254371
18	AAPL	33.298855	29.730469	322.74	1.119772
17	UNH	23.703625	28.272255	167.36	0.838141
20	FB	26.480032	32.311941	187.96	0.819280
21	GOOG	21.041399	26.226954	140.41	0.801996
24	SP500	13.036693	19.176361	74.81	0.679440
14	MRK	12.918506	22.330662	68.02	0.578174
13	JNJ	11.348013	19.777468	59.79	0.573406
10	MS	14.587154	34.622473	53.49	0.421104
16	RHHBY	7.385723	21.452019	28.87	0.343941
9	GS	7.632114	31.589258	14.17	0.241367
15	PFE	5.184229	21.948868	15.26	0.235854

The ideal sharpe ratio is 1 and above.
 Stocks with negative sharpe ratio should
 not be included in the portfolio.

Aggressive Portfolio for Peter: Peter's portfolio, though aggressive, we have made it a point that he gets an exposure to all industries. Since he is young and willing to take risks, we have given him a well diversified portfolio.

1. AMZN (Amazon)- 15%
2. MSFT (Microsoft) - 15%
3. AAPL (Apple) - 12%
4. FB (Facebook) - 10%
5. GOOG (Google) - 8%
6. MRK (Merck and CO inc.) - 12%
7. JNJ (Johnson & Johnson) - 10%
8. RHHBY (Roche Holding AG)- 10%
9. GS (Goldman Sachs) - 5%
10. PFE (Pfizer inc) - 5%

Conservative Portfolio for Patrick Conservative portfolio with lower risk and good returns

1. AMZN (Amazon)- 15%
2. MSFT (Microsoft) - 17%
3. AAPL (Apple)- 12%
4. Google (Google)- 12%
5. MRK (Merck and CO inc.) - 10%
6. JNJ (Johnson & Johnson) - 10%
7. RHHBY (Roche Holding AG)- 12%
8. GS (Goldman Sachs) - 4%
9. PFE (Pfizer inc) - 8%

Stock Recommendation

Thank you!

