Stock Analysis & Portfolio Management

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IIIT-B in collaboration with Upgrade

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Presentation Overview

Ms. Alexandra Kolishnyick (aka Alexa) is a potential client and needs consultation w.r.t her investments and suggest portfolio allocation that meets her expectation

Analysing price and returns of 12 stocks across 4 sectors with a risk-reward analysis of each of the 12 stocks along with the S&P500 index

Performing analysis of the suggested stocks for investing and forecasting the returns from the portfolio

Background

- Daughter of Famous Ukrainian Tycoon
- Alexa believes in simple and humble living and has done schooling from USA

Future Goals

- Good student with prospects of admission in Ivy League colleges
- Intention to start NGO to support Sub-Saharan African region

About Client

Financials

- Savings from money sent by parents
- Intent of not taking help from parents in starting her NGO
- Intent to invest saved money for opening NGO in future

Investor Persona

- No eagerness to disclose investment amount
- Invest in stable yet promising stocks
- Requires comprehensive report on all metrics used to device investment strategy

Aviation

Health & Pharma

Sectors for Investment

Technology

Finance

Stocks in Consideration

Aviation

American Airlines

Alaska Airlines

Hawaiian Holdings

Health & Pharma

Johnson & Johnson

Merck and Co

Bausch Health

Stocks in Consideration

Finance

Credit Suisse

Deutsch Bank

Goldman Sachs

Technology

Apple

Amazon

Google

Analysis Methodology

2 Sector-wise analysis

4 Risk analysis

1 Exploratory data analysis

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Exploratory Data Analysis

By looking at the chart, we see that at the end of 5 years, 5 stocks have returns more than 80%

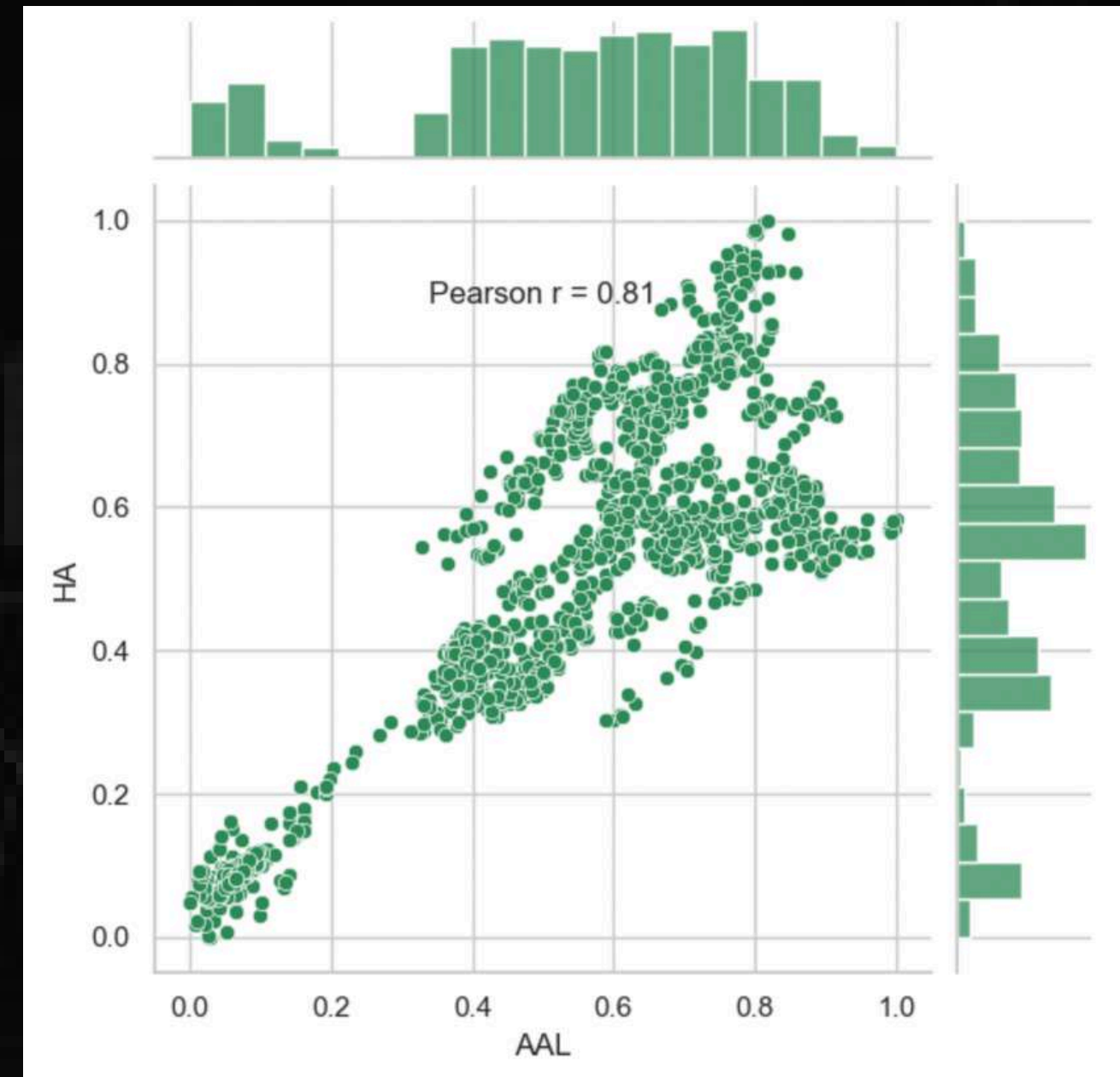Normalised Stock Values

Aviation sector Analysis

Aviation Sector has faced major crisis in March 2020 due to COVID pandemic and has not recovered there after even though the market index has gone up

Normalised Stock Values of aviation stocks vs S&P500

Aviation sector Analysis

Since the pearson coefficient between Hawaiian holdings and American Airlines is 0.81, we conclude that these 2 stock prices are highly correlated with one another

Normalised Stock Values of aviation stocks
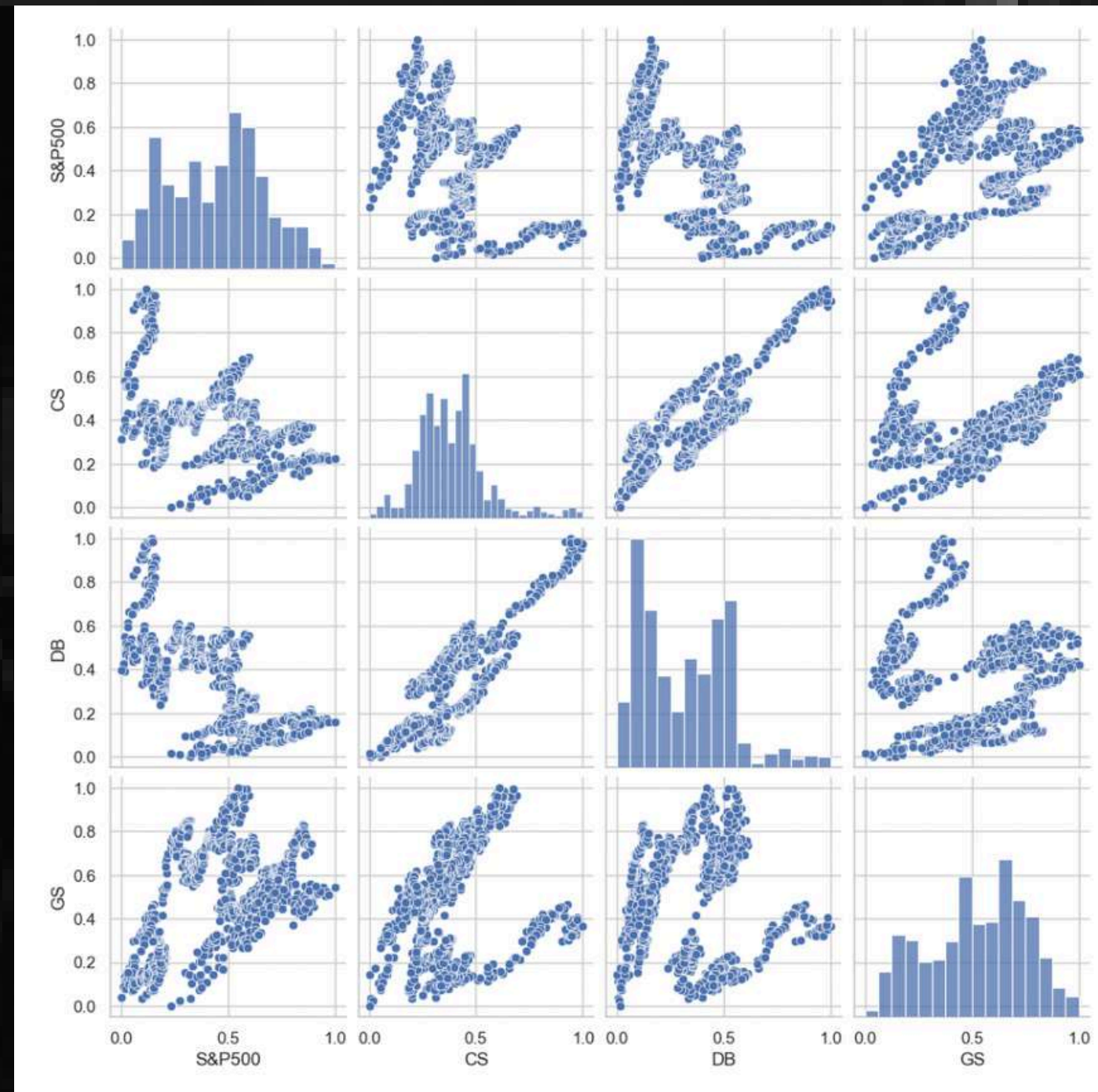
Finance sector Analysis

- Finance sector was hit hard by COVID pandemic
- Compared to Credit Suisse and Deustche Bank, Goldman Sachs has performed quite well

Normalised Stock Values of BFSI stocks vs S&P500

Finance sector Analysis

We observe that Deustche bank and Credit Suisse stock prices are highly correlated to one another

BFSI stock prices and S&P 500 with one another
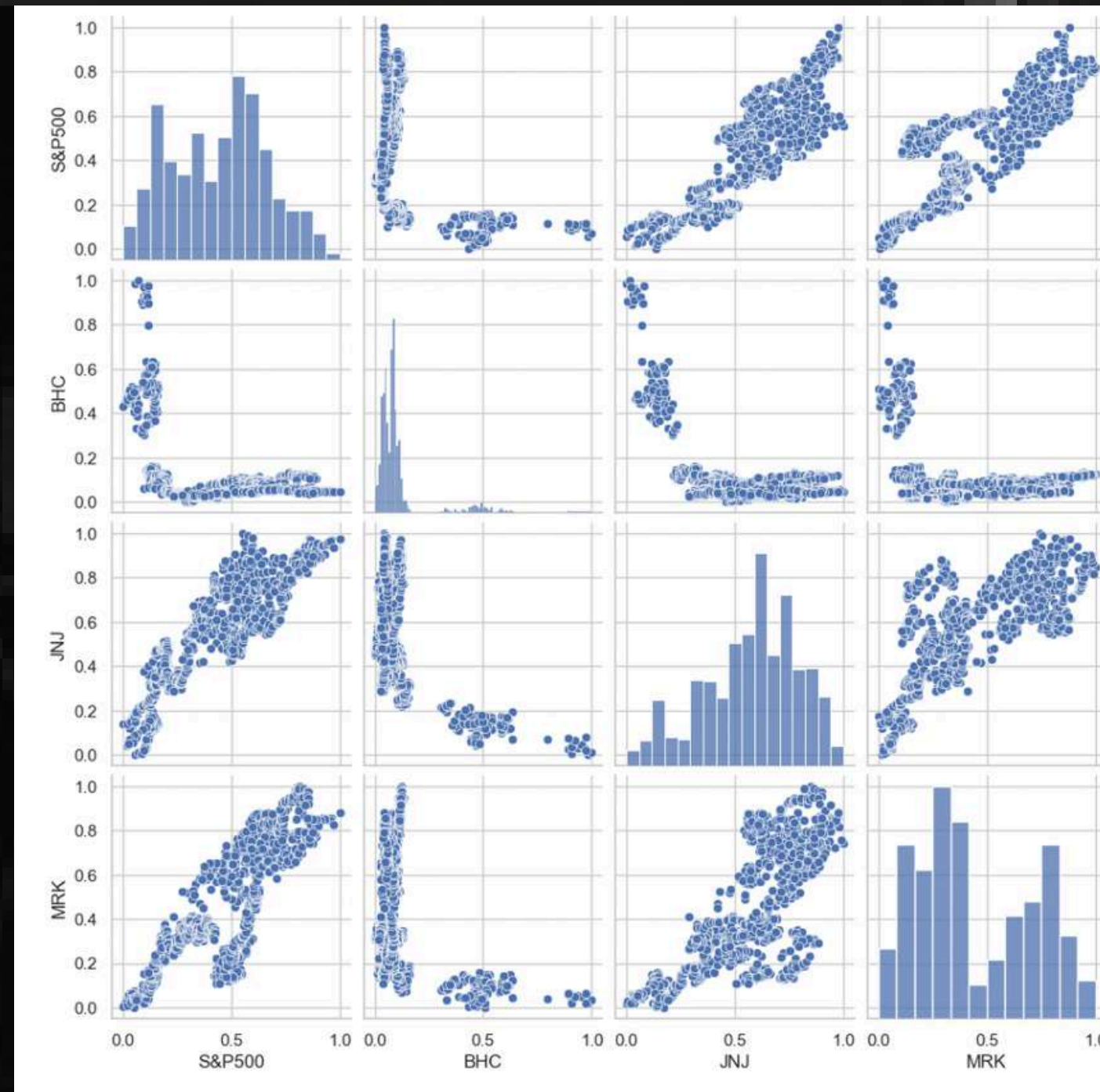
Health and Pharma sector Analysis

- Pharma and Health sector remained strong despite COVID with Bausch Health lagging
- Merck & Co. and Johnson & Johnson have outperformed S&P 500
- Bausch Health is performing consistenly poor over the years

Normalised Stock Values of BFSI stocks vs S&P500

Health and Pharma sector Analysis

Stock prices of Merck and Co and Johnson & Johnson are highly correlated to each other and both these stocks are highly related to S&P500 index

Health and Pharma stock prices and S&P 500 with one another
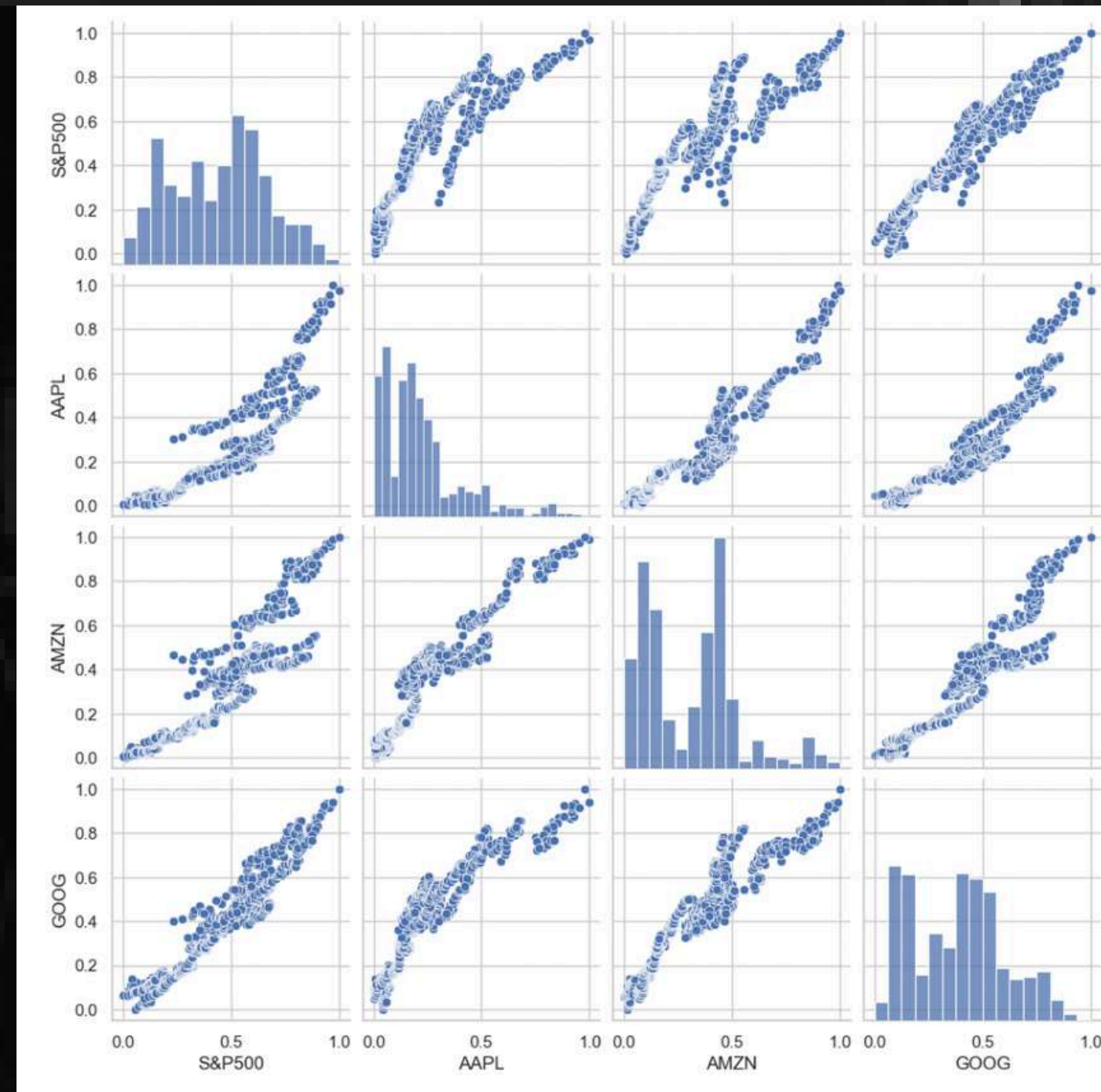
Technology sector Analysis

- Technology sector has recovered quite quickly after being hit by COVID pandemic
- Amazon and Apple have perfomed well along with the S&P500 index

Normalised Stock Values of BFSI stocks vs S&P500

Technology sector Analysis

- Technology stocks are highly related with S&P500 index
- Each of the tech stocks is highly related to one another with Amazon and apple most related

Technology stock prices and S&P 500 with one another

Daily Return Analysis

- A return, or financial return, is the profit or loss from an investment over a specific period
- A return is a percentage that represents the change in price relative to the initial price of an investment
- Returns demonstrate more favorable statistical characteristics compared to asset prices. Hence, analyzing return data rather than price series makes more statistical sense
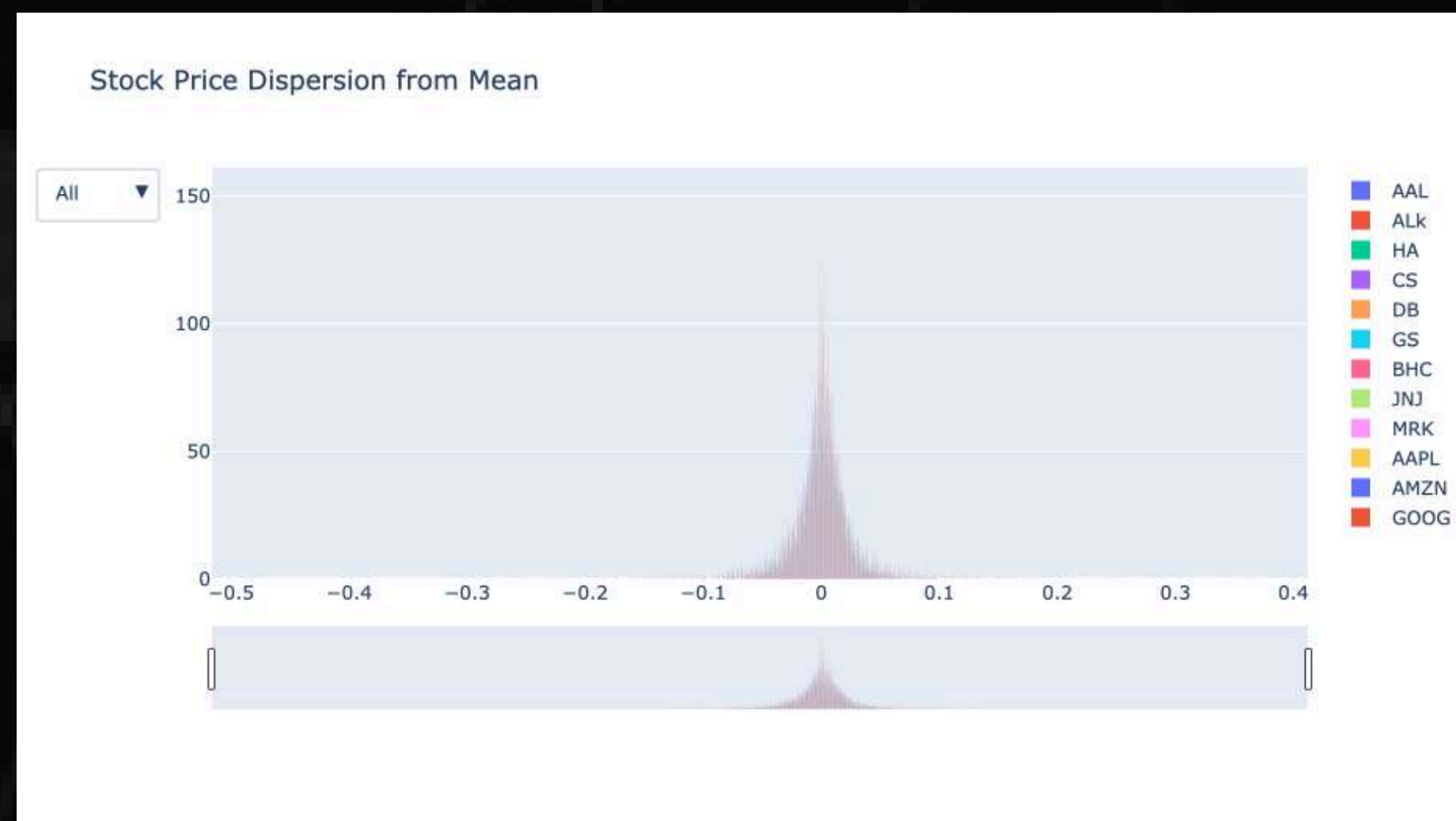
Daily Return Analysis

- AMZN & GOOG, GOOG & AAPL are correlated in the Techonolgy stocks
- CS & DB, CS & GS are highly correlated in the Finance Stocks
- AAl & ALK, AAL & HA, ALK & HA are more correlated in the Aviation stocks
- Pharma stocks are less correlated when comapred to any other sector stocks
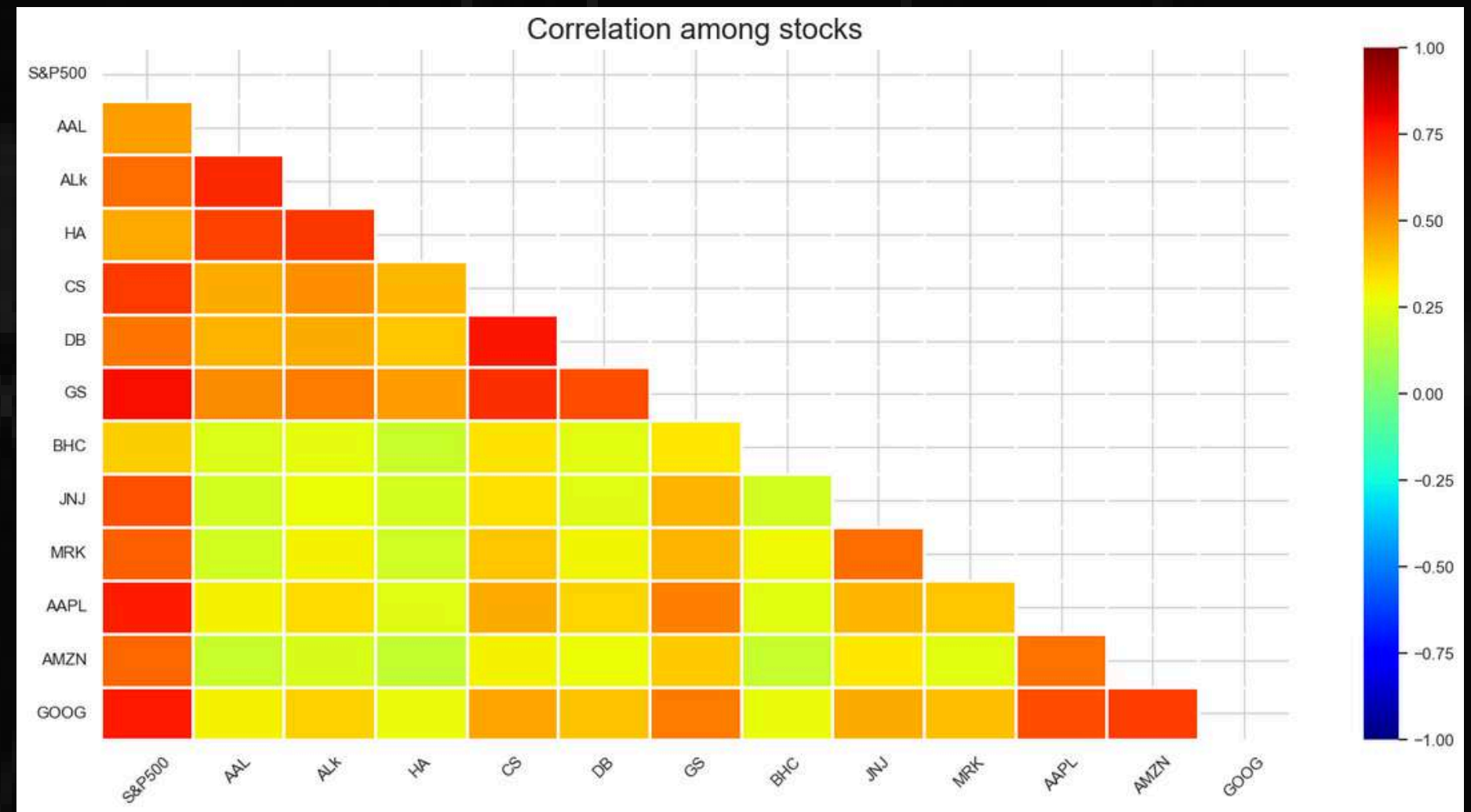
Correlation between different stock returns

Daily Return Analysis

We observe that daily returns of most of the stocks are centred around 0

Stock Price Dispersion from Mean

Correlation between different stock returns

Cumulative Daily Return Analysis

- Cumulative daily returns represent the returns on investment over a period of time by multiplying daily returns
- Amazon, Apple and Google had cumulative returns that beat the market while Merck and Co, Johnson & Johnson and Goldman Sachs had returns above 0 and rest gave negative returns

Cumulative Returns	
AMZN	504.68777
AAPL	322.741369
GOOG	140.40963
S&P500	74.808459
MRK	68.017012
JNJ	59.793934
GS	14.174524
HA	-47.877072
ALk	-54.343762
CS	-58.613533
DB	-68.325792
AAL	-68.64796
BHC	-91.347439

Correlation between different stock returns

Risk – Return Analysis

At the end of 5 years, we see that the annualised returns of Amazon (40.59%), Apple (33.32%), Google (21.02%) are greater than returns from S&P 500 index (13.04%)

	Avg Daily Returns	Risk	Min	Max	Annualized_Returns	Annualized_Risk	Sharpe_Ratio	Cumulative Returns
AMZN	0.16	1.90	-7.92	13.22	40.59	30.11	1.32	504.69
AAPL	0.13	1.87	-12.86	11.98	33.32	29.73	1.10	322.74
GOOG	0.08	1.65	-11.10	10.45	21.02	26.23	0.77	140.41
S&P500	0.05	1.21	-11.98	9.38	13.04	19.18	0.64	74.81
MRK	0.05	1.41	-8.90	10.41	12.88	22.33	0.54	68.02
JNJ	0.05	1.25	-10.04	8.00	11.35	19.78	0.54	59.79
GS	0.03	1.99	-12.71	17.58	7.64	31.59	0.22	14.17
HA	0.00	3.31	-26.50	24.58	0.86	52.60	0.00	-47.88
ALk	-0.03	2.69	-23.24	20.31	-6.44	42.71	-0.17	-54.34
AAL	-0.03	3.47	-25.22	41.10	-8.47	55.12	-0.17	-68.65
CS	-0.04	2.28	-18.26	16.34	-11.01	36.26	-0.32	-58.61
DB	-0.05	2.77	-17.49	14.02	-13.33	44.04	-0.32	-68.33
BHC	-0.09	4.46	-51.46	33.74	-22.60	70.72	-0.33	-91.35

Correlation between different stock returns

Risk – Return Analysis
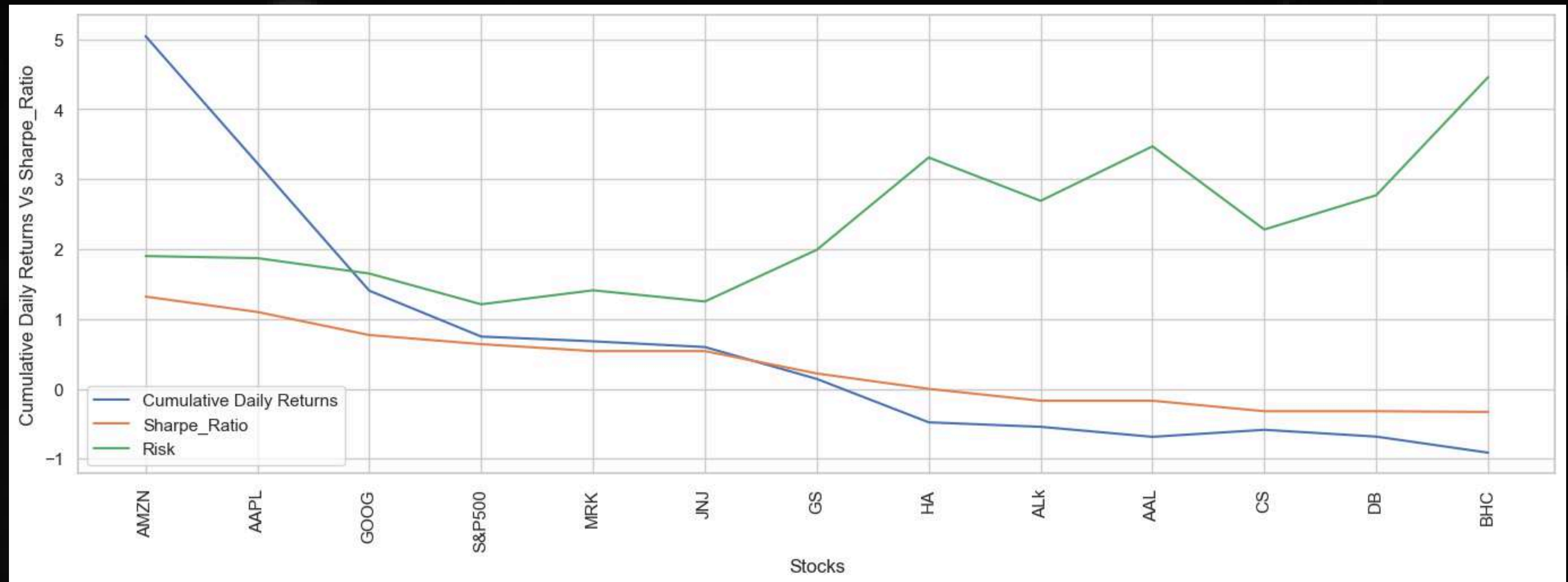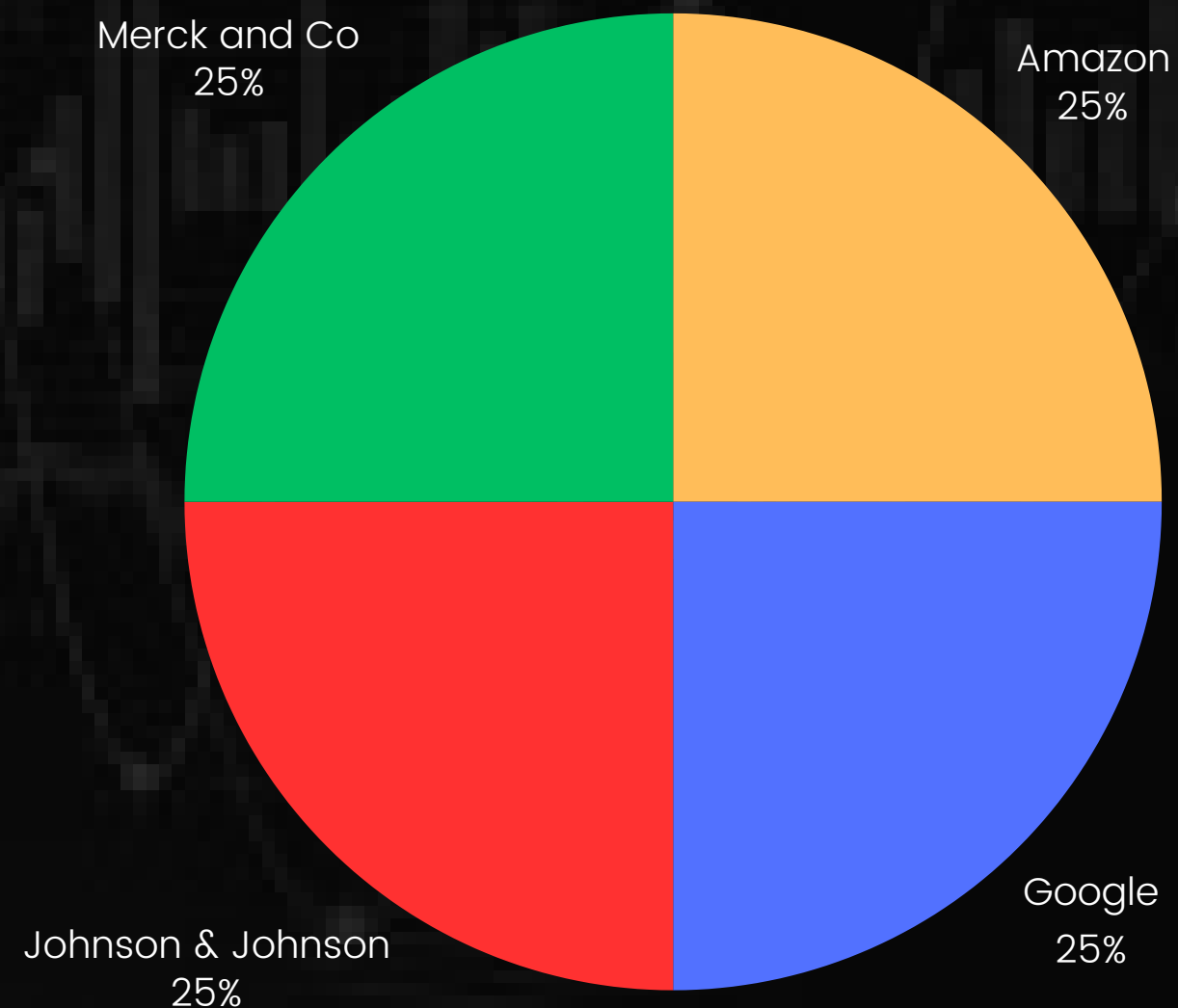

Risk-Return analysis of stock returns

Investment Strategy

Based on Ms. Kolishnyick's preference of low risk and decent returns, following is recommended:

- For low risk with good returns, investment should be made in Google, Merck and Co and Johnson & Johnson since they have least risk and decent returns
- However, to reach the investment target, A portion of investments should be made in Amazon due to its strong returns profile

Recommended Portfolio Allocation

We recommend 25% investment each in Amazon, Google, Johnson & Johnson and Merck and Co

Merck and Co
25%

Amazon
25%

Johnson & Johnson
25%

Google
25%

Recommended Portfolio Performance

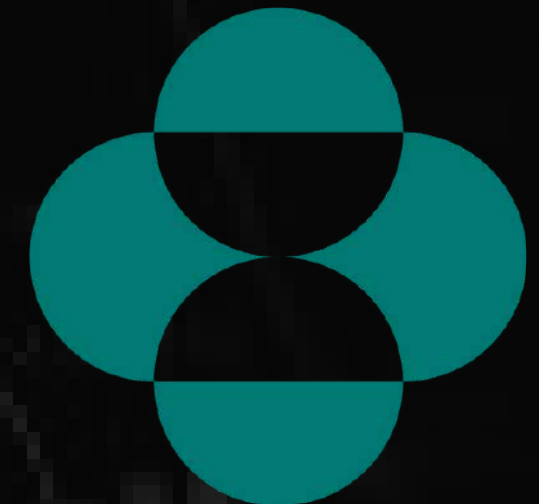|	Amazon	Google	J&J	(teal)
Average daily return	0.16%	0.08%	0.05%	0.04%
Stock Risk	1.89%	1.65%	1.40%	1.24%

Recommended Portfolio Performance

| Stock Beta | 0.9988 | 1.0133 | 0.6622 | 0.7334 |

Since beta of all 4 stocks are less than or near to 1, we see that the returns of stock move along with the market and are not much volatile
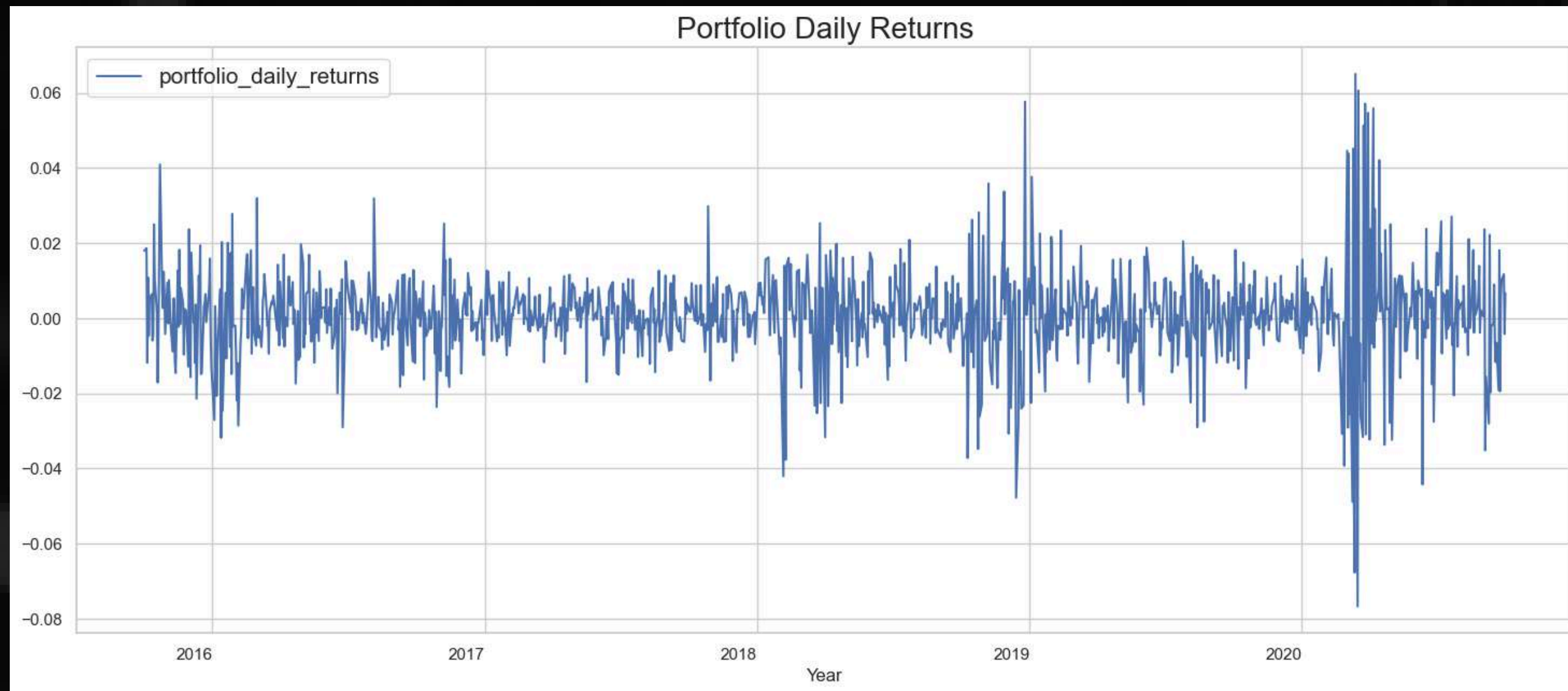
Recommended Portfolio Performance

Average Daily Returns

0.08%

Cumulative Daily Returns

1.11%

Recommended Portfolio Performance

The returns from Portfolio shows high variation between 2018 and 2019 and post 2020

Recommended Portfolio Performance

Portfolio Risk
18.97%

Sharp Ratio
0.028

Annualised Sharp Ratio
0.444

Recommended Portfolio Performance

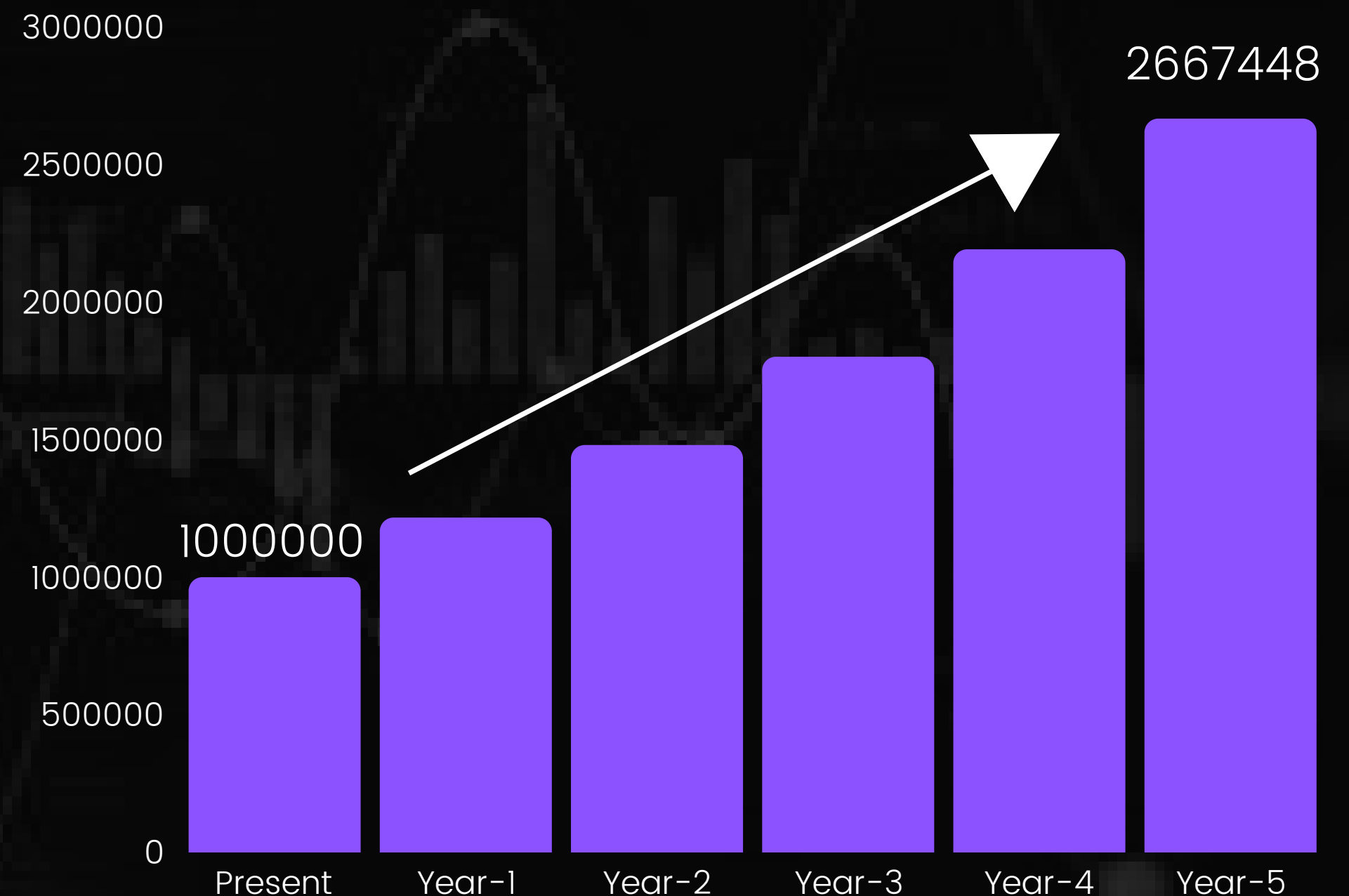$1 Million investment today gives

$2.66 Million after 5 years giving

21.68% annual returns and

166.74% overall returns

Thank you!