

The background of the slide is a light gray gradient. It is decorated with numerous realistic water droplets of various sizes. Some droplets are at the top left, some are scattered in the middle, and a larger cluster of droplets is on the right side. The droplets have highlights and shadows, giving them a three-dimensional appearance.

# FINANCE AND RISK ANALYTICS CAPSTONE PROJECT

PRESENTED BY PRIYANKA AKAVARAM

# AGENDA

- OBJECTIVE
- INFERENCES AND VISUALIZATION
- METHODOLOGY

# OBJECTIVE

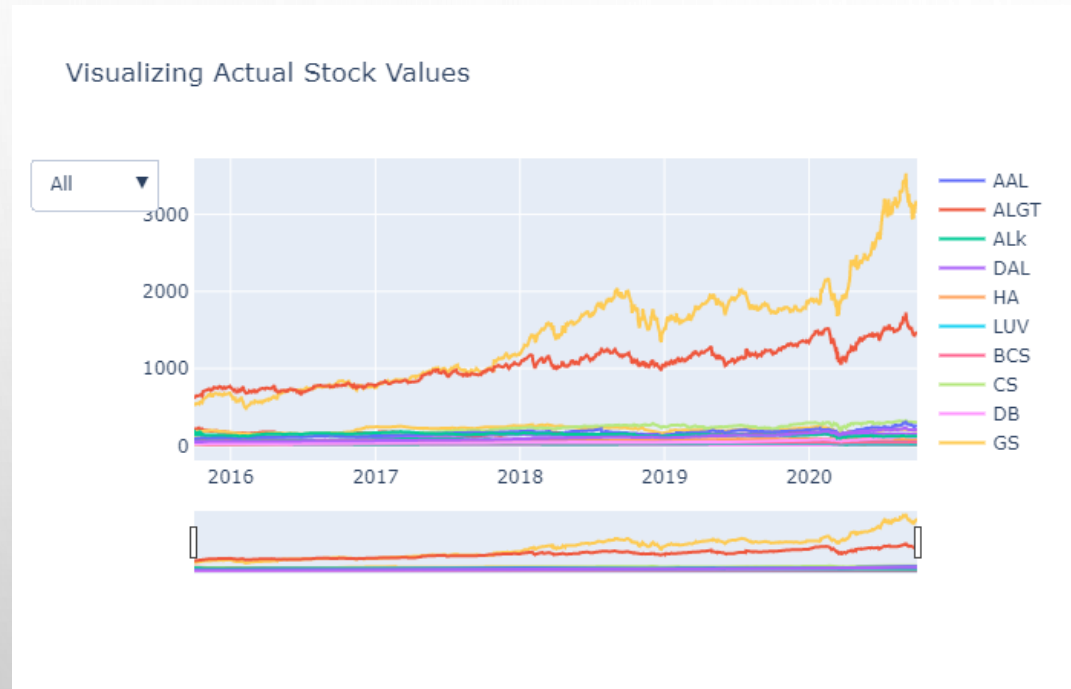
- ANALYSING A PORTFOLIO OF STOCKS TO PROVIDE CONSULTATION ON INVESTMENT MANAGEMENT BASED ON CLIENT'S REQUIREMENT. MY TASK IS TO PROVIDE CONSULTATION TO TWO DIFFERENT INVESTORS, MR PATRICK JYENGER AND MR PETER JYENGER BASED ON THEIR REQUIREMENTS AND FINANCIAL OBJECTIVES.
- MR PATRICK JYENGER WANTS TO INVEST \$500K IN EQUITIES. HE HAS BEEN CONSERVATIVE INVESTOR DURING HIS ALL LIFE AND EXPECTS DOUBLING HIS CAPITAL WITH LESS RISK IN 5 YEARS TIME.
- MR PETER JYENGER WANTS TO INVEST \$1 MILLION IN EQUITIES. HE HAS BEEN HIGH RISK INVESTOR DURING HIS ALL LIFE, PREFERS HIGH RETURN INVESTMENT AND EXPECTS DOUBLING HIS CAPITAL WITH HIGH RISK IN 5 YEARS TIME.

# INFERENCES AND VISUALIZATION

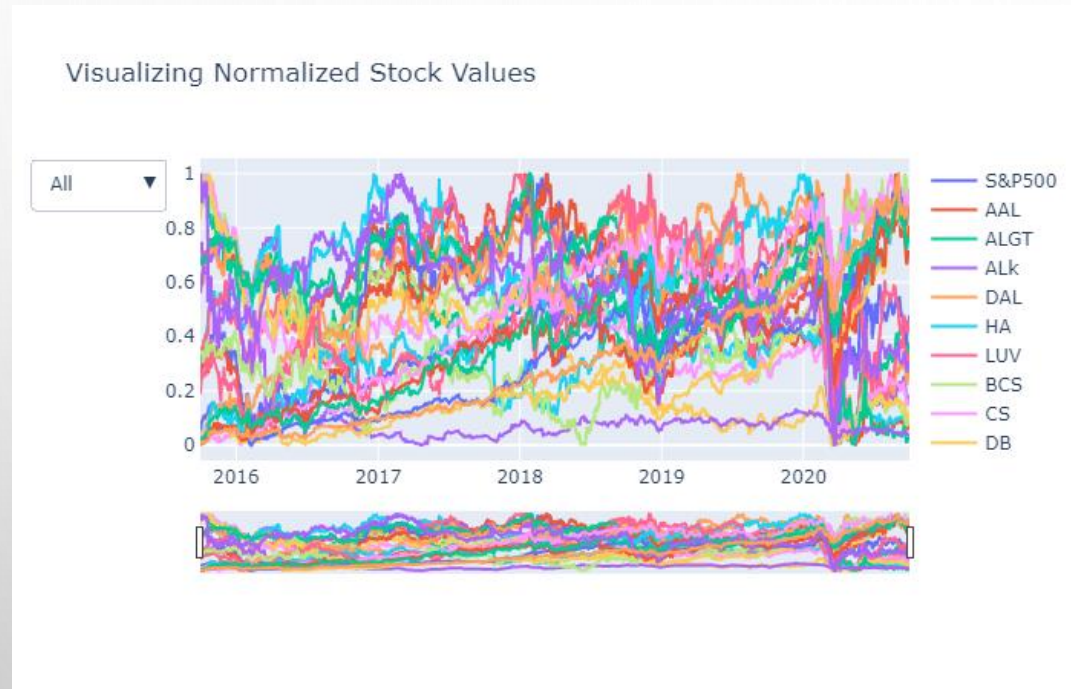
- THERE ARE 24 STOCKS AVAILABLE FROM FOUR SECTORS CONTAINING 6 STOCKS FROM EACH SECTOR.
- THERE IS AN INDEX AVAILABLE TO COMPARE THE STOCKS OUTCOME WITH. S&P500 IS A COMBINATIONS OF TOP 500 STOCKS IN US STOCK MARKET.
- THIS IS THE LIST OF STOCKS WITH THERE ABBREVIATION AND INDUSTRY AND COMPANY NAME.

ABBREVIATION	INDUSTRY	COMPANY NAME
AAL	Aviation	American Airlines Group Inc
ALGT	Aviation	Allegiant Travel Company
ALK	Aviation	Alaska Air Group Inc
DAL	Aviation	Delta Air Lines Inc
HA	Aviation	Hawaiian Holdings Inc
LUV	Aviation	Southwest Airlines Co
BCS	Finance	Barclays
CS	Finance	Credit Suisse
DB	Finance	Deutsche Bank
GS	Finance	Goldman Sachs
MS	Finance	Morgan Stanley
WFC	Finance	Wells Fargo
JNJ	Healthcare	Johnson & Johnson
MRK	Healthcare	Merck and CO inc.
PFE	Healthcare	Pfizer inc
UNH	Healthcare	UnitedHealthGroup Inc
BHC	Pharmaceuticals	Bausch Health Companies inc
RHHBY	Pharmaceuticals	Roche Holding AG
AAPL	Technology	Apple Inc
AMZN	Technology	Amazon
FB	Technology	Facebook
GOOG	Technology	Alphabet
IBM	Technology	IBM
MSFT	Technology	Microsoft

- THE ABOVE GRAPH SHOWS HOW ALL STOCKS HAVE PERFORMED OVER THE LAST 5 YEARS. THE GRAPH CLEARLY SHOWS THAT **AMAZON** AND **GOOGLE** ARE BEST PERFORMING OVER THE LAST 5 YEARS AS COMPARISON WITH OTHER STOCKS.



- ABOVE GRAPH SHOWS THAT HOW ALL THE STOCKS HAVE PERFORMED WHEN COMPARED WITH S&P500 INDEX. HERE WE CAN SEE THAT THERE ARE 8 STOCKS HAVING RETURNS OF GREATER THAN 80% AT THE END OF 5 YEARS.

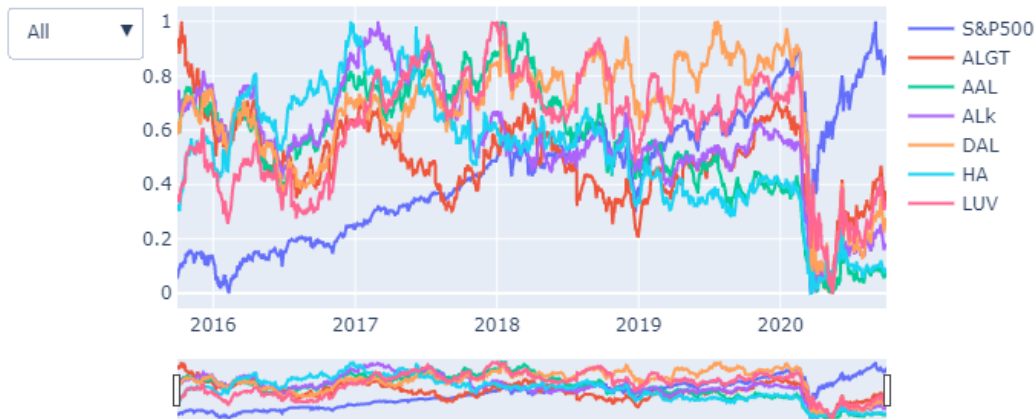




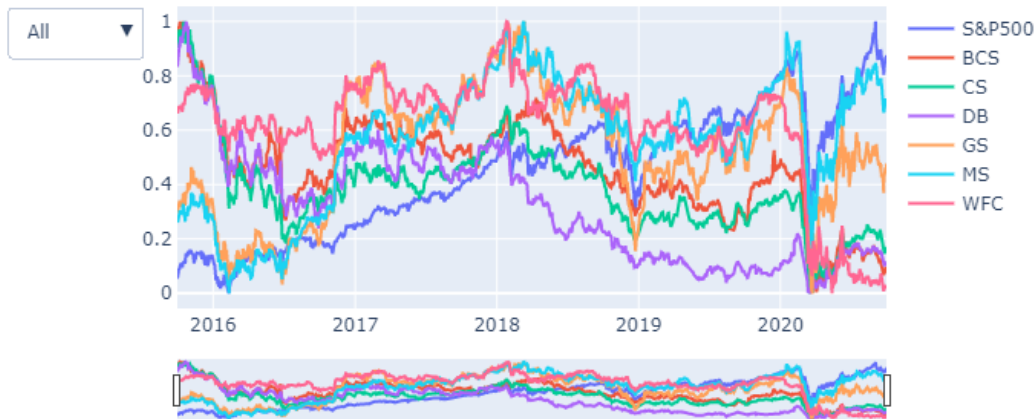
## AVIATION SECTOR

- THE STOCKS WERE CONSTANTLY MAKING SIDE WAYS BUT DUE TO CORONA PANDEMIC HIT IN MARCH 2020 AVIATION SECTOR HAS FACED A MAJOR CRISIS AND THE SECTOR HAS NOT RECOVERED THERE AFTER EVEN THOUGHT MARKET INDEX HAS HONE UP.

Visualizing Normalized Stock Values



Visualizing Normalized Stock Values



## FINANCE SECTOR

- DUE TO CORONA PANDEMIC HIT IN MARCH 2020 FINANCE SECTOR HAS ALSO FACED A MAJOR CRISIS AND THE SECTOR HAS RECOVERED A BIT ALTHOUGH MAJORITY OF STOCKS HAS BEEN HIT.
- MORGAN STANLEY & GOLDMAN SACHS HAVE PERFORMED WELL WHEN COMPARED TO OTHER STOCKS.



## PHARMA AND HEALTH SECTOR

- DUE TO CORONA PANDEMIC HIT IN MARCH 2020 PHARMA & HEALTH CARE SECTOR HAS ALSO FACED A MAJOR CRISIS AND THE RECOVERY RATE SHOWN BY THIS SECTOR IS COMMENDABLE.
- UNITED HEALTH, JOHNSON & JOHNSON HAVE PERFORMED WELL WHEN COMPARED TO S&P INDEX.
- BAUSCH HEALTH IS CONSISTENTLY PERFORMED VERY BADLY OVER THE YEARS WHEN COMPARED TO OTHER STOCKS IN THE SAME SECTOR.

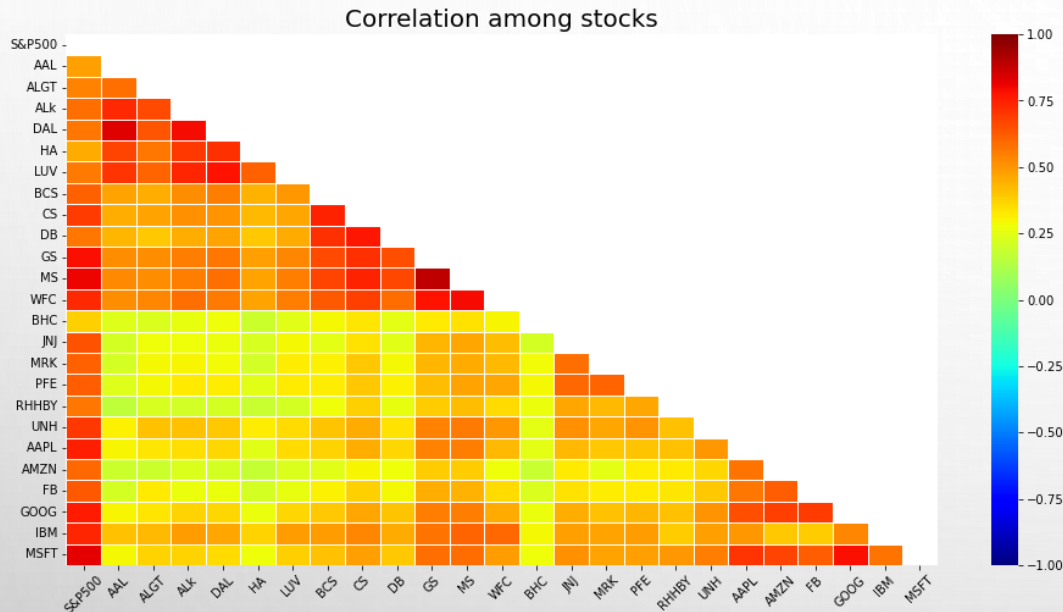


Visualizing Normalized Stock Values



## TECHNOLOGY SECTOR

- DUE TO COVID PANDEMIC HIT IN MARCH 2020 TECHNOLOGY SECTOR HAS ALSO FACED CRISIS BUT THE RECOVERY RATE SHOWN BY THIS SECTOR IS COMMENDABLE.
- MICROSOFT, AMAZON, APPLE, FACEBOOK & GOOGLE HAVE PERFORMED WELL ALONG WITH MARKET INDEX.
- THE STOCK PERFORMED VERY BADLY OVER THE YEARS WHEN COMPARED TO OTHER STOCKS IN THE SAME SECTOR IS IBM



## CORRELATION OF STOCKS

- MICROSOFT & GOOGLE STOCKS ARE HIGHLY CORRELATED IN THE TECHNOLOGY SECTOR STOCKS.
- GOLDMAN SACHS, MORGAN STANLEY & WELLS FARGO ARE CORRELATED IN THE FINANCE SECTOR STOCKS.
- AMERICAN AIRLINES & DELTA AIRLINES ARE MORE CORRELATED THAN ALASKA AIR GROUP IN THE AVIATION SECTOR STOCKS.
- PHARMA SECTOR STOCKS ARE LESS CORRELATED WHEN COMPARED TO ANY OTHER SECTOR STOCKS.

- AT THE END OF 5 YEARS, THE TOP 8 STOCKS WITH RETURNS GREATER THAN 80%
- AMZN GIVES 40.59% ANNUAL RETURNS.
- MSFT GIVES 34.95% ANNUAL RETURNS.
- AAPL GIVES 33.32% ANNUAL RETURNS.
- FB GIVES 26.45% ANNUAL RETURNS.
- UNH GIVES 23.72% ANNUAL RETURNS.
- GOOG GIVES 21.02% ANNUAL RETURNS.
- MS GIVES 14.55% ANNUAL RETURNS.
- S&P500 GIVES 13.04% ANNUAL RETURNS.

# METHODOLOGY

## EXPLORATORY DATA ANALYSIS:

- CHECKED THE NULL VALUES IN THE DATASET. IT WAS FOUND THAT NO COLUMNS HAVE NULL VALUES.
- CHECKED FOR THE OUTLIERS IN THE DATASET.

## DATA ANALYSIS:

- ANALYSED THE STOCK DATA USING DIFFERENT CALCULATION LIKE DAILY RETURNS, CUMULATIVE DAILY RETURN, SHARPE RATIO, PORTFOLIO RISK AND RETURN ON INVESTMENT(ROI).
- FOUND BEST SUITABLE STOCKS FOR ALL PORTFOLIOS.

## INFERENCES AFTER ANALYSING THE DATA:

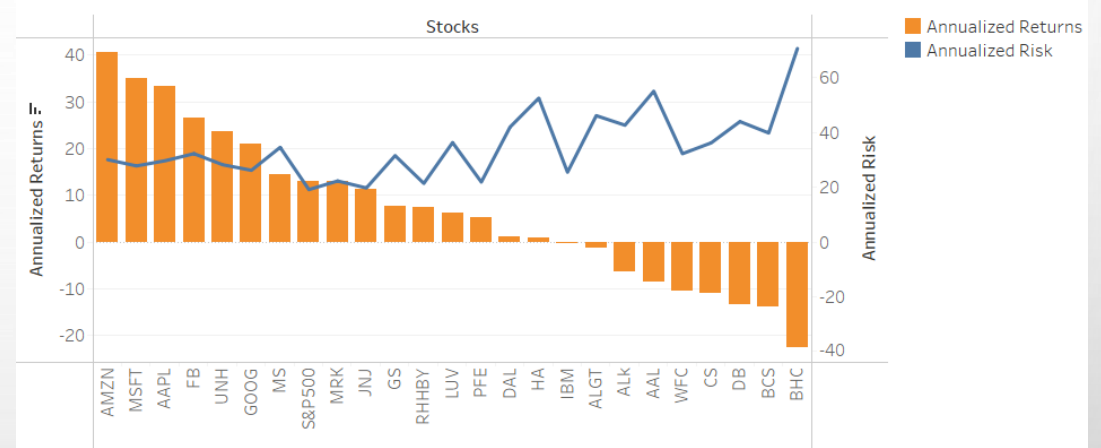
- AS WE FOUND OUT THAT THERE ARE 8 STOCKS WHICH GIVES MORE THAN 80% IN LAST FIVE YEARS OF STOCK MARKET.
- THE STOCKS THAT GIVES BEST RETURN AMONG ALL STOCKS ARE AMZN, MSFT, AAPL, FB, UNH, GOOG, MS, S&P500.
- EACH STOCK HAS DIFFERENT RISK AND LIABILITY ACCORDING TO ITS ANNUALIZED RISK, SHARPE RATIO.
- WE FOUND OUT THAT **AMZN** GIVES HIGHEST RETURN AMONG ALL STOCK BUT HAS HIGH RISK AS COMPARED TO OTHER STOCKS.
- WE ALSO FOUND THAT STOCKS LIKE **JNJ**, **RHHBY**, **MRK** AND **MSFT** HAVE GOOD RETURNS WITH LESS RISK.
- SO AFTER DOING ALL THE ANALYSIS WE HAVE FINALIZED THE PORTFOLIO FOR BOTH THE CUSTOMERS.



## ANNUALISED RISK AND RETURNS

- ANNUALIZED RETURN OF TOP FIVE STOCKS ARE **AMZN, MSFT, AAPL, FB, UNH**.
- ALL TOP 5 STOCKS HAVE ANNUALIZED RETURN OF MORE THAN 20.
- THE RISK OF THESE FIVE STOCK IS AT MEDIUM LEVEL AS COMPARISON WITH OTHER STOCKS.
- THE LESSER THE RETURN THE MORE CHANCES OF LOSING THE MONEY AND DEBITING THE INITIAL INVESTMENT.
- THE RISK IS HIGHER FOR **BHC, BCS, DB, CS, WFC** AS THEY DID NOT EVEN GIVE RETURN ON INVESTMENT AS IT WAS AT THE TIME OF INVESTING.
- THE LESSER THE ROI THE HIGHER THE RISK IN THE STOCKS, INSTEAD THERE ARE THOSE STOCKS WHO DOES NOT PROVIDE BEST RETURN BUT AT LEAST GIVE RISK FREE INVESTMENT OPPORTUNITY.
- THE STOCKS WITH LESS RISK AND GOOD RETURN ARE **JNJ, RHHBY, MRK**.

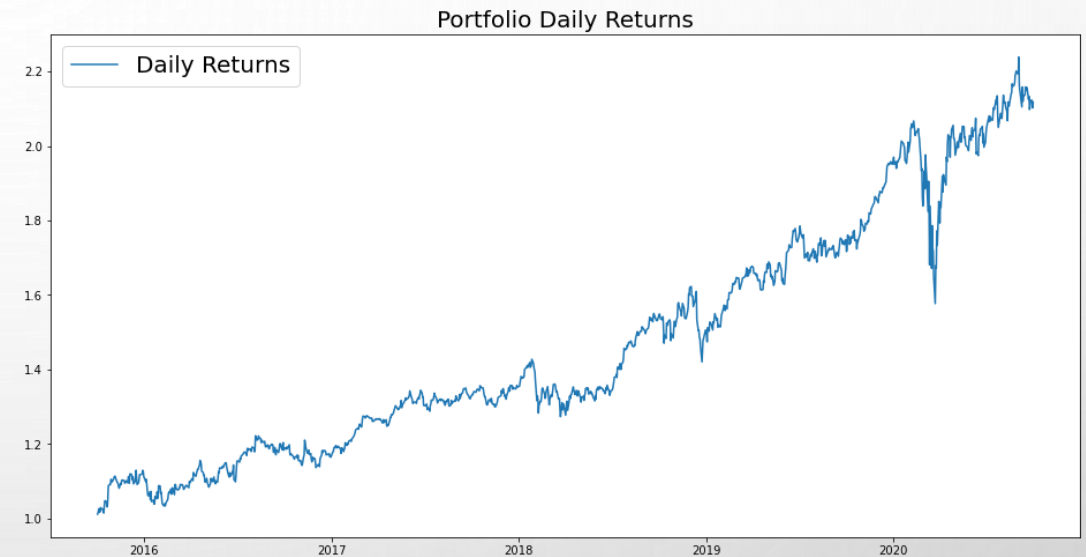
Annualized Return & Annualized Risk



The trends of Annualized Returns and Annualized Risk for Stocks. Colour shows details about Annualized Returns and Annualized Risk.

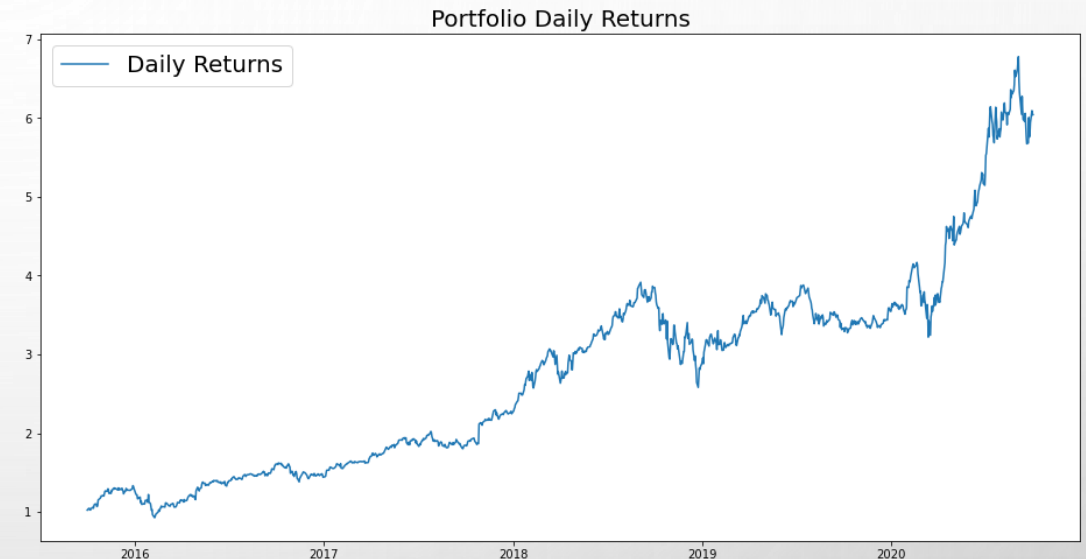
## PATRICK JYENGAR PORTFOLIO

- MR PATRICK JYENGAR WANTS TO DOUBLE HIS INVESTMENT IN THE SPAN ON 5 YEARS. HE WANTS TO INVEST IN LOW RISK STOCKS WHICH WOULD FETCH HIM DECENT RETURNS.
- AS PER HIS PROFILE LOW RISK STOCKS LIKE **JNJ**, **RHHBY** AND **MRK** IS SUITABLE TO INVEST ON. BUT OVERALL RETURNS WITH THESE THREE STOCKS WOULDN'T REACH THE TARGET WHAT MR PATRICK IS INVESTING FOR. SO ONE PORTION OF HIS WEALTH CAN BE INVESTED ON **MSFT** TO GAIN THE DESIRED RETURNS.
- KEEPING ALL THE WEIGHTAGE OF STOCKS EQUAL THAT IS **0.25 ACROSS ALL STOCKS**.
- AS MR PATRICK JYENGAR INVESTS **500 THOUSAND DOLLAR** IN EQUITIES I.E. THE ABOVE PORTFOLIO. RETURNS THAT HE WOULD FETCH AFTER 5 YEARS IS **1.05 MILLION DOLLAR** WITH **558.23 THOUSAND DOLLAR** OF GAIN ON INVESTMENT.



## PETER JYENGAR PORTFOLIO

- MR PETER JYENGAR ON THE OTHER HAND CONSISTENT WITH HIS ATTITUDE TOWARDS RISK, HE PREFERS HIGH-RETURN INVESTMENTS. BELIEVES THAT HE CAN STILL BOUNCE BACK IN CASE OF ANY OCCASIONAL LOSSES.
- HE WANTS TO INVEST \$1 MILLION FROM COMPANY'S CASH AND CASH EQUIVALENTS IN THE MOST HIGH-MARGIN STACKS EXPECTS HIGH RETURNS WITHIN 5 YEARS FOR INORGANIC EXPANSION OF HIS COMPANY.
- AS PER HIS PROFILE HIGH RISK/HIGH RETURNS STOCKS LIKE **AMZN** IS SUITABLE TO INVEST ON.
- OVERALL RETURNS WITH THIS STOCK WOULD FETCH HIM MAXIMUM RETURNS AND ALSO CATER THE RISK. RISK ASSOCIATED WITH THE ABOVE MENTIONED PORTFOLIO.
- AS MR PETER JYENGAR INVESTS **1 MILLION** DOLLAR ON EQUITIES I.E. THE **AMZN STOCK**. RETURNS THAT HE WOULD FETCH AFTER 5 YEARS IS MORE THAN **6 MILLION** DOLLARS WITH **5+ MILLION** DOLLARS OF **GAIN ON INVESTMENT**.





THANK YOU