Q1 Analysis Of MANG Stock Tickers

Introduction: As a part of my online 4 month internship at **Unified Mentor Private Limited**, I have been given various datasets to perform data analysis, data manipulation and data visualization on them.

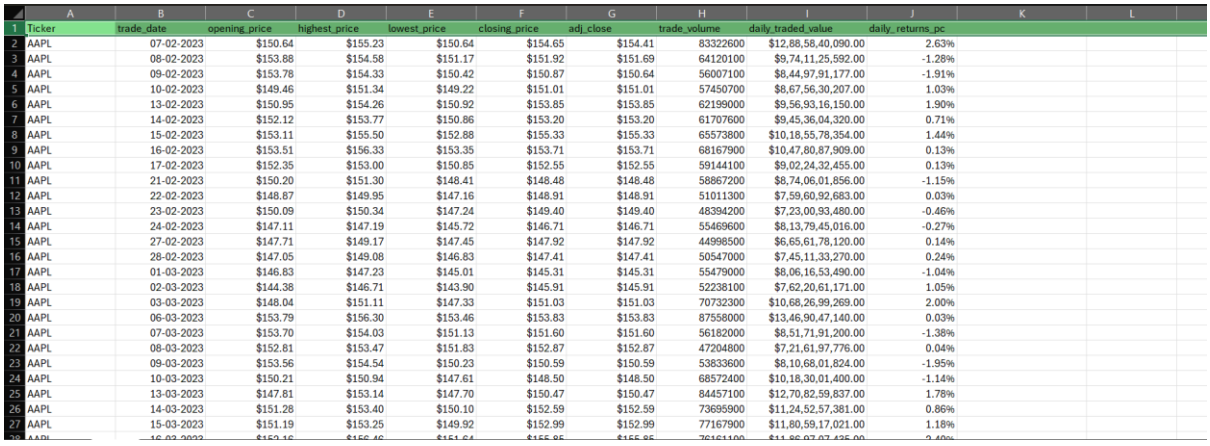
As a part of this project, I have chosen to perform these tasks on the Quarter 1 of 2023 data of stock ticker of **Microsoft**, **Apple**, **Netflix** and **Google**. I analyzed, cleaned, manipulated, modelled and visualized 249 row of data across 10 columns in a dataset, and created a pivot table of the data for deeper stock ticker analysis.

The data analysis, modelling, manipulation tasks were primarily carried out using Microsoft Excel due to the dataset being small enough to be analyzed using spreadsheets. I also used **Microsoft Copilot** for debugging my query for errors, showcasing my excel/spreadsheet skills as a Data Analyst as well as Artificial Intelligence prompt query writing.

The data visualization was performed using R programming language as my primary go to tool for this project to showcase my skill in using R programming language for data manipulation modelling and visualization in order to build a strong foundation for my future endeavors in complex data visualization using other tools like Python.

Methodology

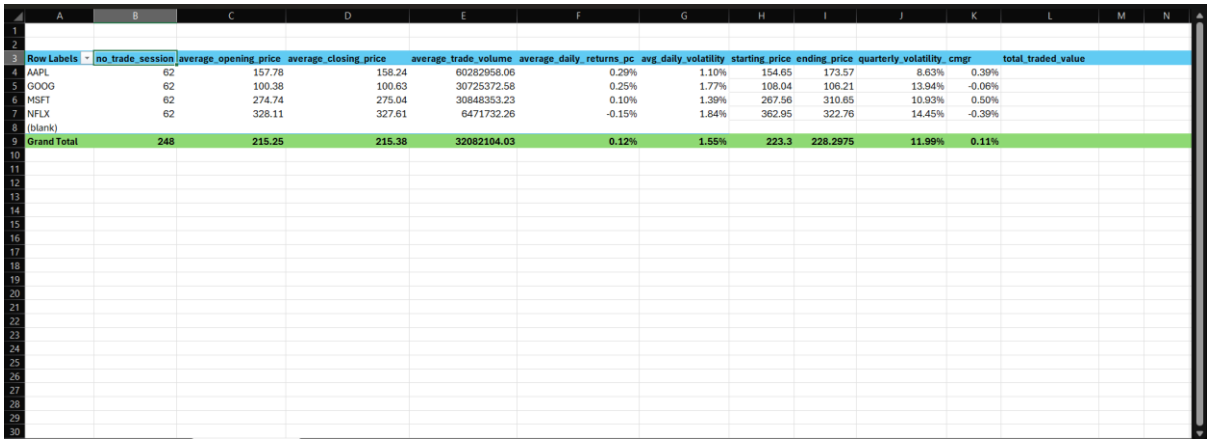
- Data Cleaning, Preparation:- Due to the small size of the given dataset, I primarily used Microsoft Excel for my data cleaning, preparation and manipulation. All the NULL values we're removed and formatting of the columns was done in accordance of the type of data contained under it, for example: columns with currency values were formatted for currency, percentage columns were formatted for percentage values, all the numbers were rounded off to two places after decimal to maintain data uniformity.



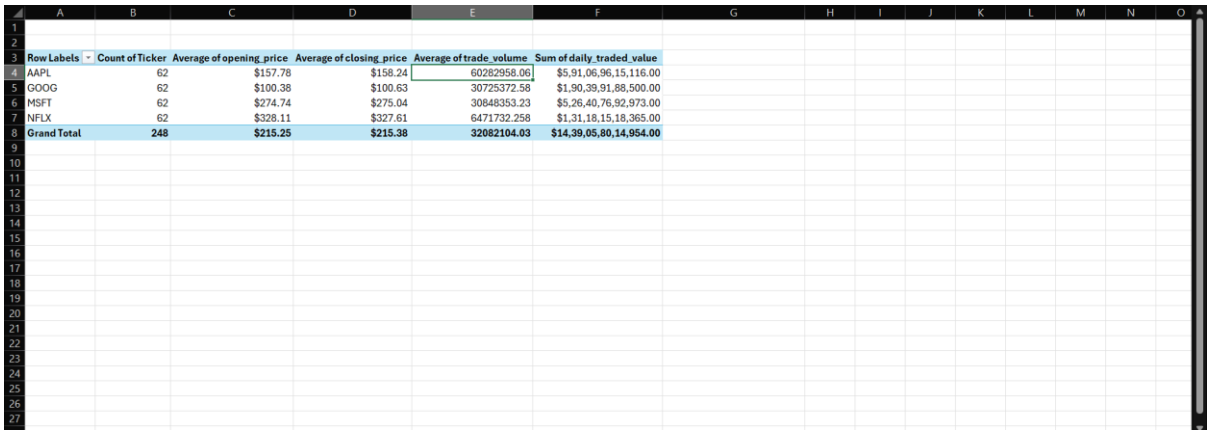
	A	B	C	D	E	F	G	H	I	J	K	L
1	Ticker	trade_date	opening_price	highest_price	lowest_price	closing_price	adj_close	trade_volume	daily_traded_value	daily_returns_pc		
2	AAPL	07-02-2023	$150.64	$155.23	$150.64	$154.65	$154.41	83322600	$12,88,58,40,090.00	2.63%		
3	AAPL	08-02-2023	$153.88	$154.58	$151.17	$151.92	$151.69	64120100	$9,74,11,25,592.00	-1.28%		
4	AAPL	09-02-2023	$153.78	$154.33	$150.42	$150.87	$150.64	56007100	$8,44,97,91,177.00	-1.91%		
5	AAPL	10-02-2023	$149.46	$151.34	$149.22	$151.01	$151.01	57450700	$8,67,56,30,207.00	1.03%		
6	AAPL	13-02-2023	$150.95	$154.26	$150.92	$153.85	$153.85	62199000	$9,56,93,16,150.00	1.90%		
7	AAPL	14-02-2023	$152.12	$153.77	$150.86	$153.20	$153.20	61707600	$9,45,36,04,320.00	0.71%		
8	AAPL	15-02-2023	$153.11	$155.50	$152.88	$155.33	$155.33	65573800	$10,18,55,78,354.00	1.44%		
9	AAPL	16-02-2023	$153.51	$156.33	$153.35	$153.71	$153.71	68167900	$10,47,80,87,909.00	0.13%		
10	AAPL	17-02-2023	$152.35	$153.00	$150.85	$152.55	$152.55	59144100	$9,02,24,32,455.00	0.13%		
11	AAPL	21-02-2023	$150.20	$151.30	$148.41	$148.48	$148.48	58867200	$8,74,06,01,856.00	-1.15%		
12	AAPL	22-02-2023	$148.87	$149.95	$147.16	$148.91	$148.91	51011300	$7,59,60,92,683.00	0.03%		
13	AAPL	23-02-2023	$150.09	$150.34	$147.24	$149.40	$149.40	48394200	$7,23,00,93,480.00	-0.46%		
14	AAPL	24-02-2023	$147.11	$147.19	$145.72	$146.71	$146.71	55469600	$8,13,79,45,016.00	-0.27%		
15	AAPL	27-02-2023	$147.71	$149.17	$147.45	$147.92	$147.92	44998500	$6,65,61,78,120.00	0.14%		
16	AAPL	28-02-2023	$147.05	$149.08	$146.83	$147.41	$147.41	50547000	$7,45,11,33,270.00	0.24%		
17	AAPL	01-03-2023	$146.83	$147.23	$145.01	$145.31	$145.31	55479000	$8,06,16,53,490.00	-1.04%		
18	AAPL	02-03-2023	$144.38	$146.71	$143.90	$145.91	$145.91	52238100	$7,62,20,61,171.00	1.05%		
19	AAPL	03-03-2023	$148.04	$151.11	$147.33	$151.03	$151.03	70732300	$10,68,26,99,269.00	2.00%		
20	AAPL	06-03-2023	$153.79	$156.30	$153.46	$153.83	$153.83	87558000	$13,46,90,47,140.00	0.03%		
21	AAPL	07-03-2023	$153.70	$154.03	$151.13	$151.60	$151.60	56182000	$8,51,71,91,200.00	-1.38%		
22	AAPL	08-03-2023	$152.81	$153.47	$151.83	$152.87	$152.87	47204800	$7,21,61,97,776.00	0.04%		
23	AAPL	09-03-2023	$153.56	$154.54	$150.23	$150.59	$150.59	53833600	$8,10,68,01,824.00	-1.95%		
24	AAPL	10-03-2023	$150.21	$150.94	$147.61	$148.50	$148.50	68572400	$10,18,30,01,400.00	-1.14%		
25	AAPL	13-03-2023	$147.81	$153.14	$147.70	$150.47	$150.47	84457100	$12,70,82,59,837.00	1.78%		
26	AAPL	14-03-2023	$151.28	$153.40	$150.10	$152.59	$152.59	73695900	$11,24,52,57,381.00	0.86%		
27	AAPL	15-03-2023	$151.19	$153.25	$149.92	$152.99	$152.99	77167900	$11,80,59,17,021.00	1.18%		

- Data Manipulation: The given data was not sufficient to create informative models and visuals. Hence I went ahead with creating more datasets into the spreadsheet and in Pivot Tables, in

order to to make the data more in line with the business requirements of utility of the data. Calculations like "daily traded value" , "daily return percentage" , "average daily returns" , "average daily volatility", "cumulative monthly growth rate" etc were performed.



Row Labels	no_trade_session	average_opening_price	average_closing_price	average_trade_volume	average_daily_returns_pc	avg_daily_volatility	starting_price	ending_price	quarterly_volatility	cmgr	total_traded_value
AAPL	62	157.78	158.24	60282958.06	0.29%	1.10%	154.65	173.57	8.63%	0.39%	
GOOG	62	100.38	100.63	30725372.58	0.25%	1.77%	108.04	106.21	13.94%	-0.06%	
MSFT	62	274.74	275.04	30848353.23	0.10%	1.39%	267.56	310.65	10.93%	0.50%	
NFLX	62	328.11	327.61	6471732.26	-0.15%	1.84%	362.95	322.76	14.45%	-0.39%	
(blank)											
Grand Total	**248**	**215.25**	**215.38**	**32082104.03**	**0.12%**	**1.55%**	**223.3**	**228.2975**	**11.99%**	**0.11%**	



Row Labels	Count of Ticker	Average of opening_price	Average of closing_price	Average of trade_volume	Sum of daily_traded_value
AAPL	62	$157.78	$158.24	60282958.06	$5,91,06,96,15,116.00
GOOG	62	$100.38	$100.63	30725372.58	$1,90,39,91,88,500.00
MSFT	62	$274.74	$275.04	30848353.23	$5,26,40,76,92,973.00
NFLX	62	$328.11	$327.61	6471732.258	$1,31,18,15,18,365.00
Grand Total	**248**	**$215.25**	**$215.38**	**32082104.03**	**$14,39,05,80,14,954.00**

- Data Visualization: For this project, I went ahead with the use of R programming language to create informative data visuals in order to showcase my skills in usage and implementation of R programming language for data visualization.

```
install.packages('tidyverse')

library('tidyverse')

library(ggplot2)

install.packages("skimr")

install.packages("janitor")

library(tidyverse)

library(skimr)
```

library(janitor)

 # install special package for excel sheets

install.packages("readxl")

library(readxl)

 # Verify file location

file.exists("C:/Users/hunte/Documents/stocks.xlsx")

 # Load data into a sample dataset.

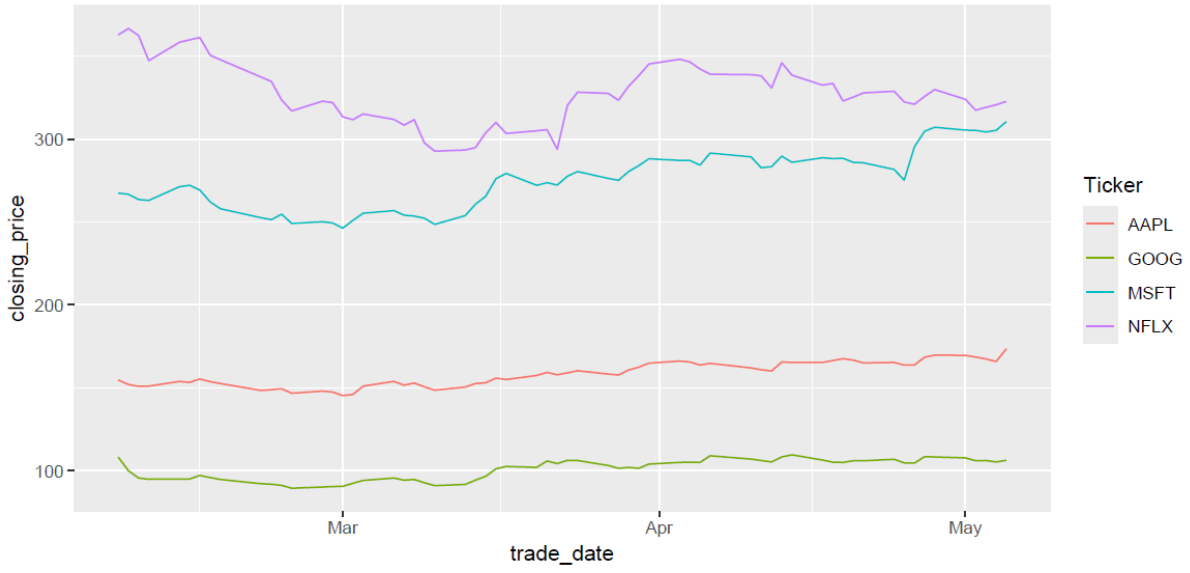
stocks_data<- read_excel("C:/Users/hunte/Documents/stocks.xlsx", sheet="stocks")

View(stocks_data)

#Plotting Graphs

ggplot(data=stocks_data) + geom_line(mapping = aes(x= trade_date, y= closing_price, color = Ticker))

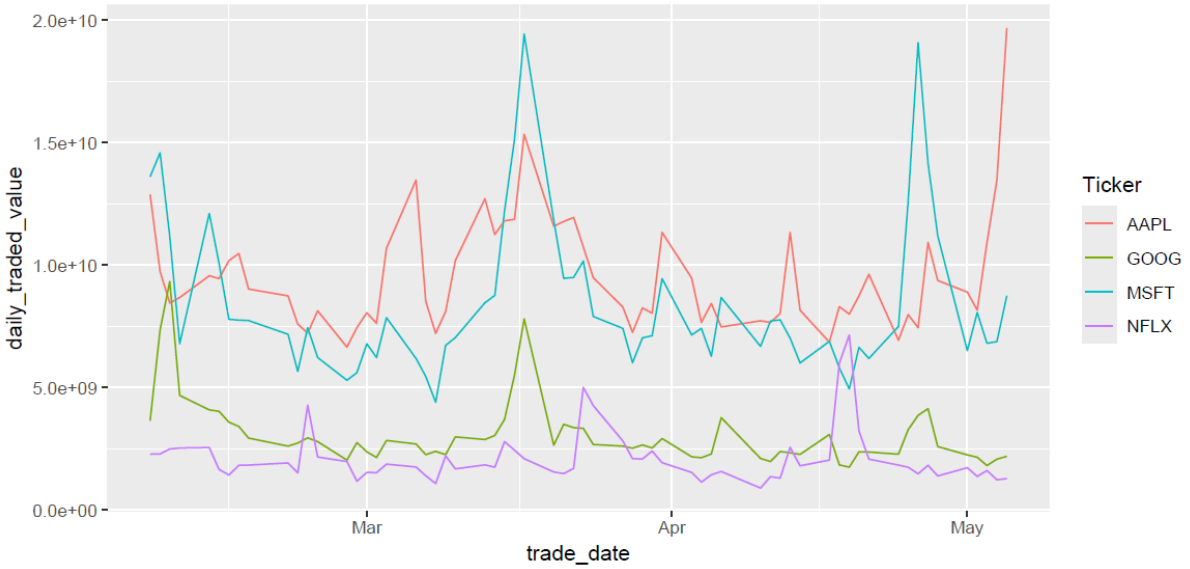
Q1 Daily Movement Of Stocks



ggplot(data=stocks_data) + geom_line(mapping = aes(x= trade_date, y= daily_traded_value,

color = Ticker))

Q1 Daily Traded Value Of Stocks



#Using Pivot file data as new dataset

pivotfile_data<- read_excel("C:/Users/hunte/Documents/stocks.xlsx", sheet="pivot_table_stocks")

View(pivotfile_data)

pivotfile_data2<- pivotfile_data[-5,]

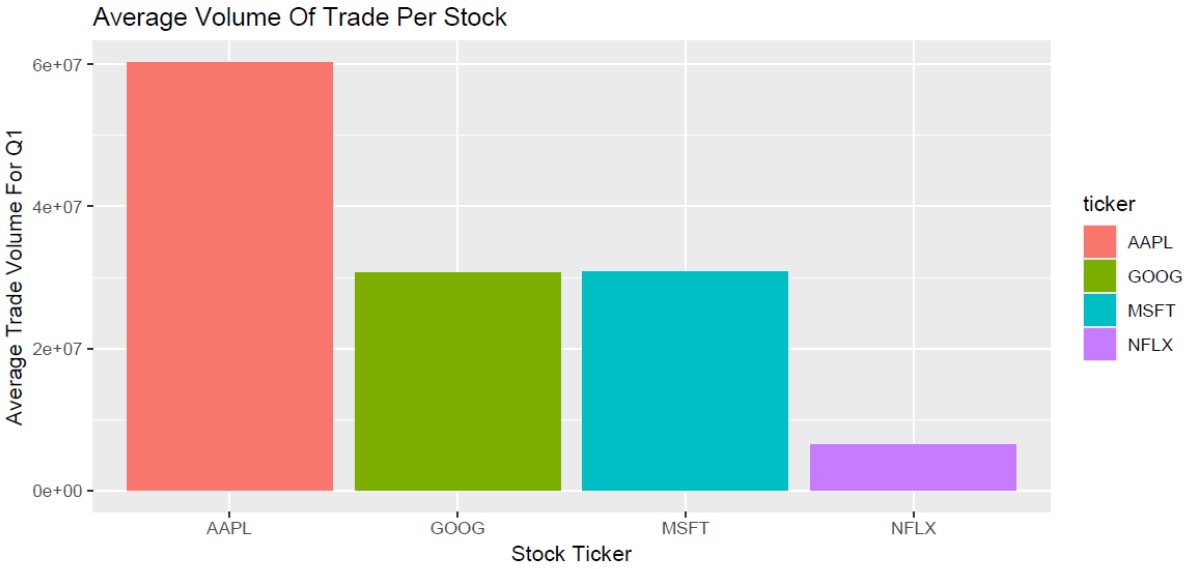
View(pivotfile_data2)

Plotting Average Volume Of Trade Per Stock Q1

ggplot(data= pivotfile_data2, aes(x= ticker, y=average_trade_volume, fill= ticker)) +

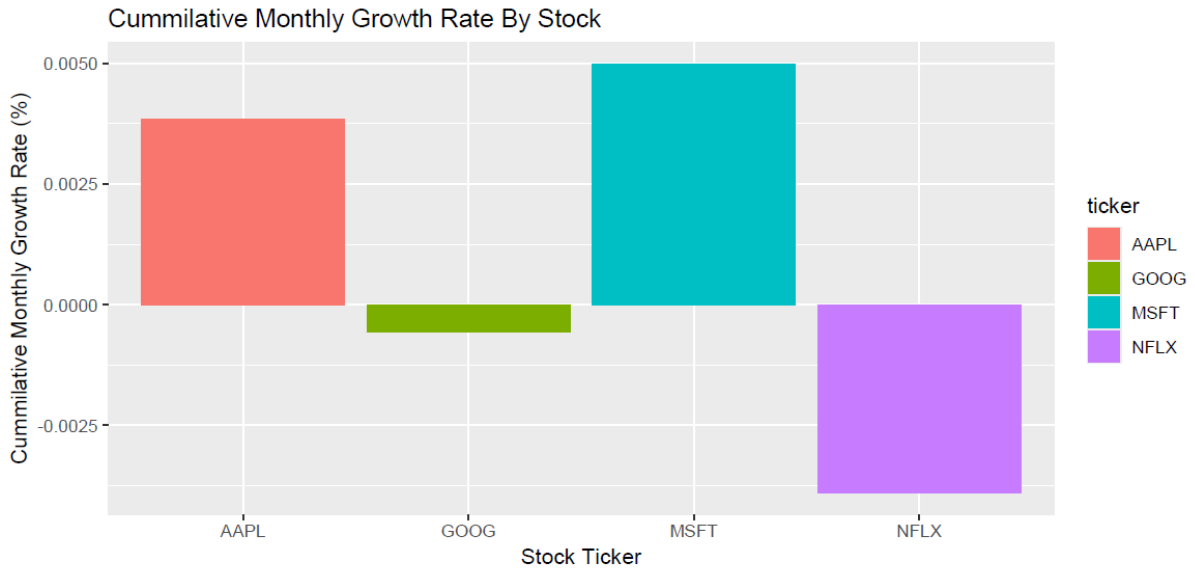
geom_bar(stat="identity") + labs(title= 'Average Volume Of Trade Per Stock', x= 'Stock Ticker', y= 'Average Trade Volume For Q1')

Q1 Average Volume Of Trade Per Stock



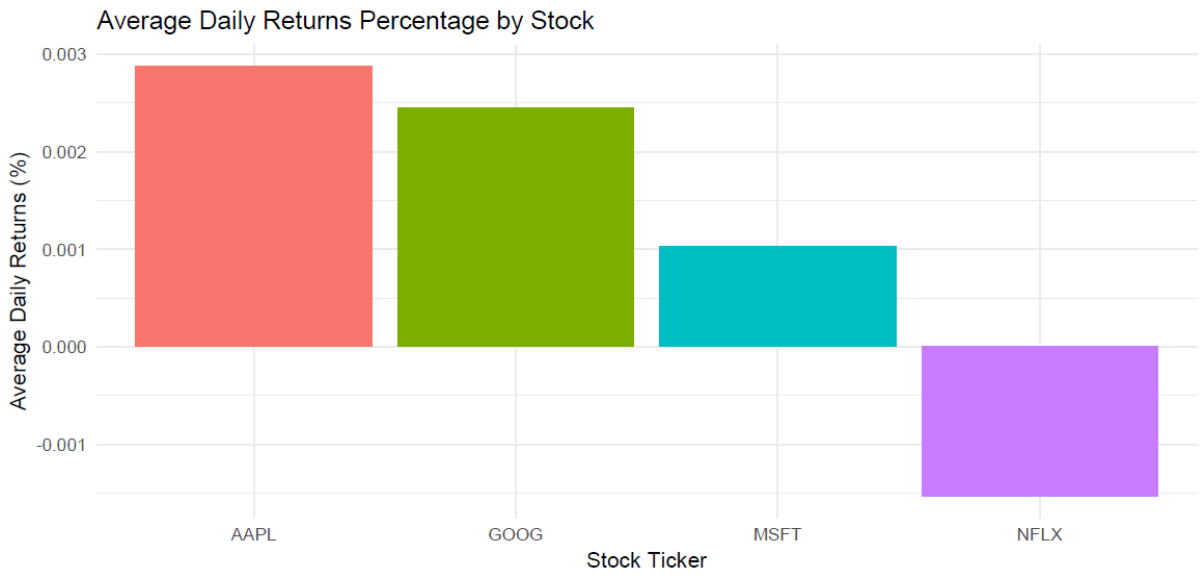

```
# Plotting Cummilative Monthly Growth Rate

ggplot(data= pivotfile_data2, aes(x= ticker, y= cmgr , fill = ticker)) +

geom_bar(stat = "identity") + labs(title= 'Cummilative Monthly Growth Rate By Stock',

x= 'Stock Ticker', y = 'Cummilative Monthly Growth Rate (%)')
```

Q1 Cumulative Monthly Growth Rate Of Stocks




```
ggplot(data = pivotfile_data2, aes(x = ticker, y = average_daily_ returns_pc, fill = ticker)) +
 geom_bar(stat = "identity") +
 labs(title = "Average Daily Returns Percentage by Stock",
 x = "Stock Ticker",
 y = "Average Daily Returns (%)") +
 theme_minimal() +
 theme(legend.position = "none")
```

Q1 Average Daily Returns (%) Of Stocks



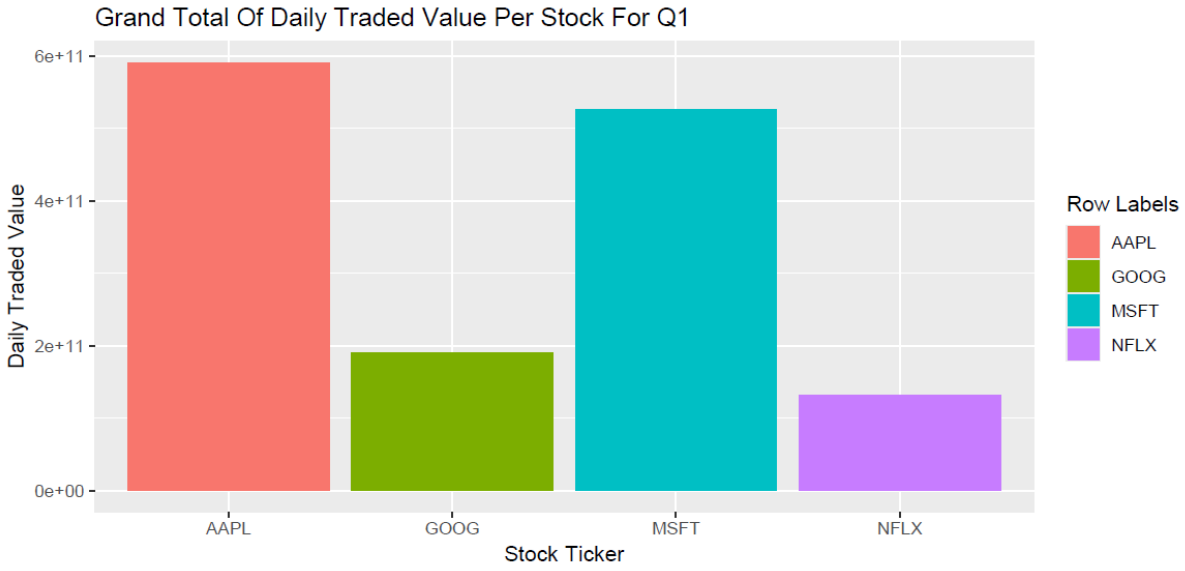
 # Using pivot_table2 as a new dataset for plotting

```
pivot_table_2 <- read_excel("C:/Users/hunte/Documents/stocks.xlsx",
sheet="pivot_table2")

view(pivot_table_2)

pivot_table_2_clean <- pivot_table_2[-5, ]

view(pivot_table_2_clean)
```

 # Plotting Grand Total Of Daily Traded Value Per Stock For Q1

```
ggplot(data = pivot_table_2_clean, aes(x = Row Labels, y = Sum of
daily_traded_value, fill = Row Labels)) +

geom_bar(stat = "identity") +

labs(title = "Grand Total Of Daily Traded Value Per Stock For Q1", x = "Stock Ticker",

y = "Daily Traded Value")
```

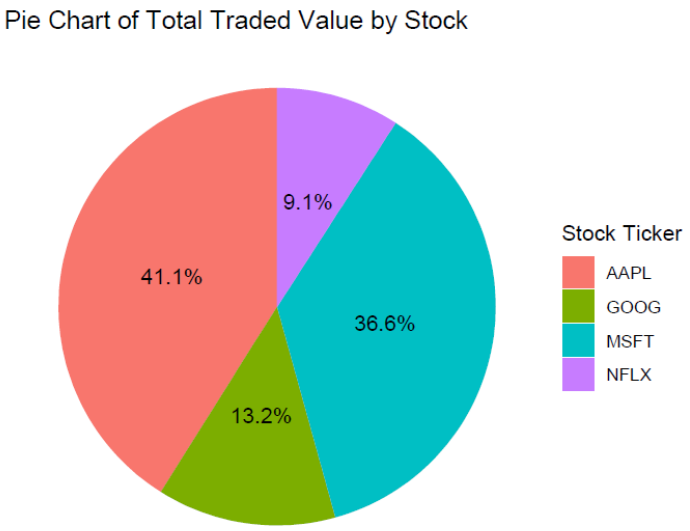
Q1 Grand Total Sum Of Daily Trade Value Of Stocks



 # Plotting Pie Chart Of Total Traded Value By Stock

```
library(scales)

ggplot(pivot_table_2_clean, aes(x = "", y = `percent_daily_traded_value`, fill = `Row Labels`)) +
  geom_bar(stat = "identity", width = 1) +
  coord_polar("y") +
  geom_text(aes(label = paste0(round(percent_daily_traded_value, 1), "%")),
            position = position_stack(vjust = 0.5)) +
  labs(title = "Pie Chart of Total Traded Value by Stock",
       fill = "Stock Ticker") +
  theme_void()
```

Pie Chart Of Total Traded Value By Stock



- Scope Of Data: Over 1 quarter of data points of Microsoft, Google, Apple and Netflix across 10 Columns we're cleaned, analyzed and manipulated from a financial and business use perspective.

Insights:

1. Netflix has the highest average price per share, even though it has the least market share among all the 5 stocks under analysis. Followed by Microsoft, Apple and Google respectively.
2. Microsoft has grown the most in the Quarter under analysis based on the Cumulative Monthly Growth Rate (calculated as CMGR/cmgr). Followed by Apple, Google and Netfilx respectively.
3. Apple has seen the most amount of stocks traded on as average for the Quarter under analysis. Followed by Microsoft, closely followed by Google and finally Netflix respectively.
4. Apple has given the most returns on an average per day. Followed by Google, Microsoft and Netflix respectively.
5. Apple has the highest market share of all stock for the quarter under analysis based on the total stocks exchanged for the quarter. Followed by Microsoft, Google and Netflix.

- Salil Panwar