APPLE (NASDAQ) DAILY STOCK PRICE ANALYSIS

INTRODUCTION

- This dataset is scraped from the [Alpha Vantage API](#) which provides real-time and historical data of stock market prices.

- I scraped the data in Python using the Alpha Vantage API.

- In data scrapping, Symbol which is used is "APPL"

- "AAPL", is the stock symbol for Apple Inc., an American multinational technology company that designs, develops, and sells consumer electronics, computer software, and online services.

- Tools that I used during this analysis are Python and Excel.

A GLANCE OF THE DATASET

- This real-time dataset is comprised of 5 months from Mar-2023 to July 2023. It has 6 variables date, open, high, low, close, and volume.

- Variables for Apple stock market under NASDAQ, we can define in the following way:

- Open: The opening price of AAPL stock on a given trading day

- High: The highest price that AAPL stock reached on a given trading day

- Low: The lowest price that AAPL stock reached on a given trading day

- Close: The closing price of AAPL stock on a given trading day

- Volume: The total number of shares of AAPL stock that were traded on a given trading day on NASDAQ

Date	Open	High	Low	Close	Volume
27/07/2023	196.02	197.2	192.55	193.22	47460180
26/07/2023	193.67	195.64	193.32	194.5	47471868
25/07/2023	193.33	194.44	192.915	193.62	37283201
24/07/2023	193.41	194.91	192.25	192.75	45505097
21/07/2023	194.1	194.97	191.23	191.94	71951683
20/07/2023	195.09	196.47	192.495	193.13	59581196
19/07/2023	193.1	198.23	192.65	195.1	80507323
18/07/2023	193.35	194.33	192.415	193.73	48353774
17/07/2023	191.9	194.32	191.81	193.99	50520159
14/07/2023	190.23	191.1799	189.63	190.69	41616242
13/07/2023	190.5	191.19	189.78	190.54	41342338
12/07/2023	189.68	191.7	188.47	189.77	60750248
11/07/2023	189.16	189.3	186.6	188.08	46638119
10/07/2023	189.26	189.99	187.035	188.61	59922163
07/07/2023	191.41	192.67	190.24	190.68	46814998
06/07/2023	189.84	192.02	189.2	191.81	45156009
05/07/2023	191.565	192.98	190.62	191.33	46920261
03/07/2023	193.78	193.88	191.76	192.46	31458198
30/06/2023	191.63	194.48	191.26	193.97	85213216
29/06/2023	189.08	190.07	188.94	189.59	46347308
28/06/2023	187.93	189.9	187.6	189.25	51216801
27/06/2023	185.89	188.39	185.67	188.06	50730846
26/06/2023	186.83	188.05	185.23	185.27	48088661
23/06/2023	185.55	187.56	185.01	186.68	53116996
22/06/2023	183.74	187.045	183.67	187	51245327
21/06/2023	184.9	185.41	182.5901	183.96	49515697

THE APPROACH USED FOR ANALYSIS

We will explore the dataset by using the following approach:

- Descriptive Statistics

- Distribution of Variables

- Correlation between Variables

- Visual representation of the correlation between variables

- Trend analysis of time-series data

- Pivot table for examining the average open, high, low, close, and volume

- Hypothesis Testing

DESCRIPTIVE STATISTICS

- Apple product's average opening price is $173, minimum opening price is $148 and maximum opening price is $195

- Apple product's average high price is $173, minimum high price is $148 and maximum high price is $195

- Apple product's average low price is $172, minimum opening price is $148 and maximum opening price is $193

- Apple product's average closing price is $173, minimum closing price is $148 and maximum closing price is $195

- Apple product's average number of shares is 58M, minimum share is 31M and maximum share is 121M

Opening Price		*High Price*		*Low Price*		*Closing Price*		*Number of Shares*	
Mean	173.27	Mean	173.27	Mean	172.17	Mean	173.61803	Mean	58022825.93
Standard Error	1.3152	Standard Error	1.3152	Standard Error	1.3188	Standard Error	1.3109009	Standard Error	1629280.302
Median	173	Median	173	Median	171.6	Median	172.69	Median	52472936
Mode	165.19	Mode	165.19	Mode	#N/A	Mode	172.07	Mode	#N/A
Standard Deviation	13.086	Standard Deviation	13.086	Standard Deviation	13.122	Standard Deviation	13.043299	Standard Deviation	16211134.32
Sample Variance	171.24	Sample Variance	171.24	Sample Variance	172.18	Sample Variance	170.12766	Sample Variance	2.62801E+14
Kurtosis	-1.124	Kurtosis	-1.124	Kurtosis	-1.1	Kurtosis	-1.112793	Kurtosis	3.19914486
Skewness	0.0238	Skewness	0.0238	Skewness	0.0047	Skewness	0.0102954	Skewness	1.652459622
Range	47.285	Range	47.285	Range	45.71	Range	46.6	Range	90488299
Minimum	147.81	Minimum	147.81	Minimum	147.61	Minimum	148.5	Minimum	31458198
Maximum	195.09	Maximum	195.09	Maximum	193.32	Maximum	195.1	Maximum	121946497
Sum	17153	Sum	17153	Sum	17045	Sum	17188.185	Sum	5744259767
Count	99	Count	99	Count	99	Count	99	Count	99

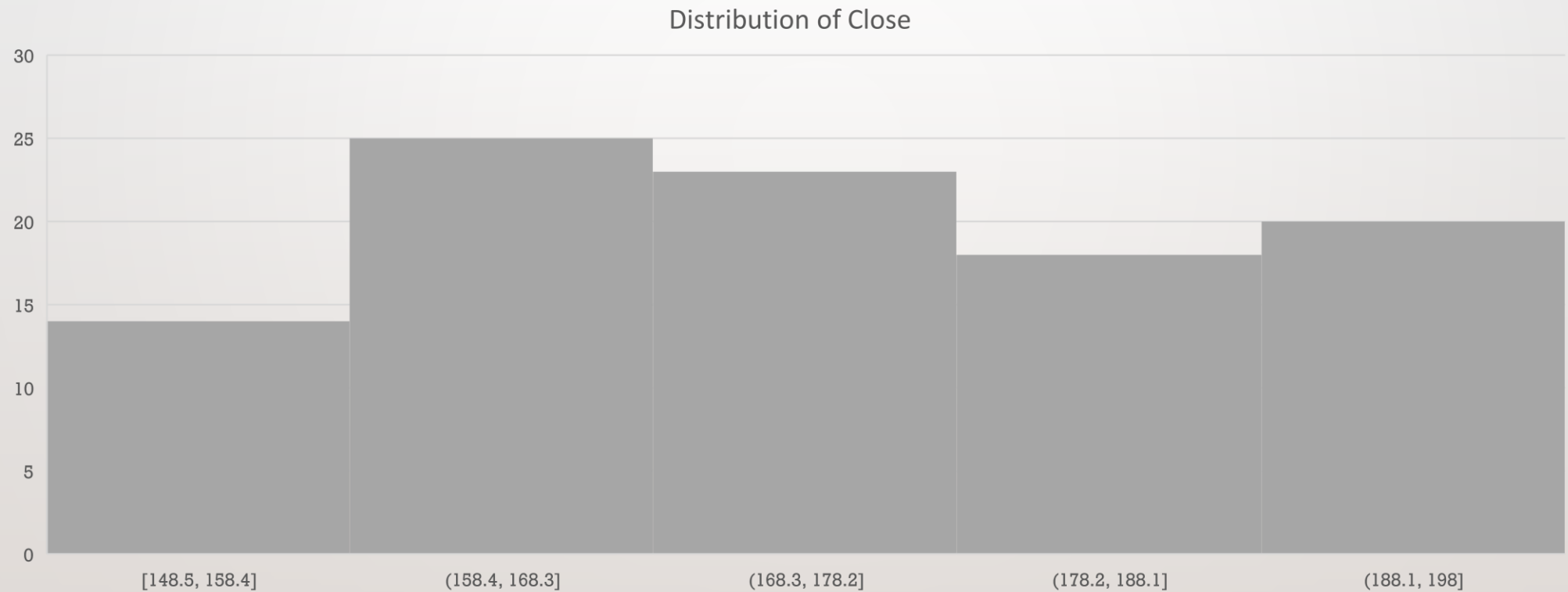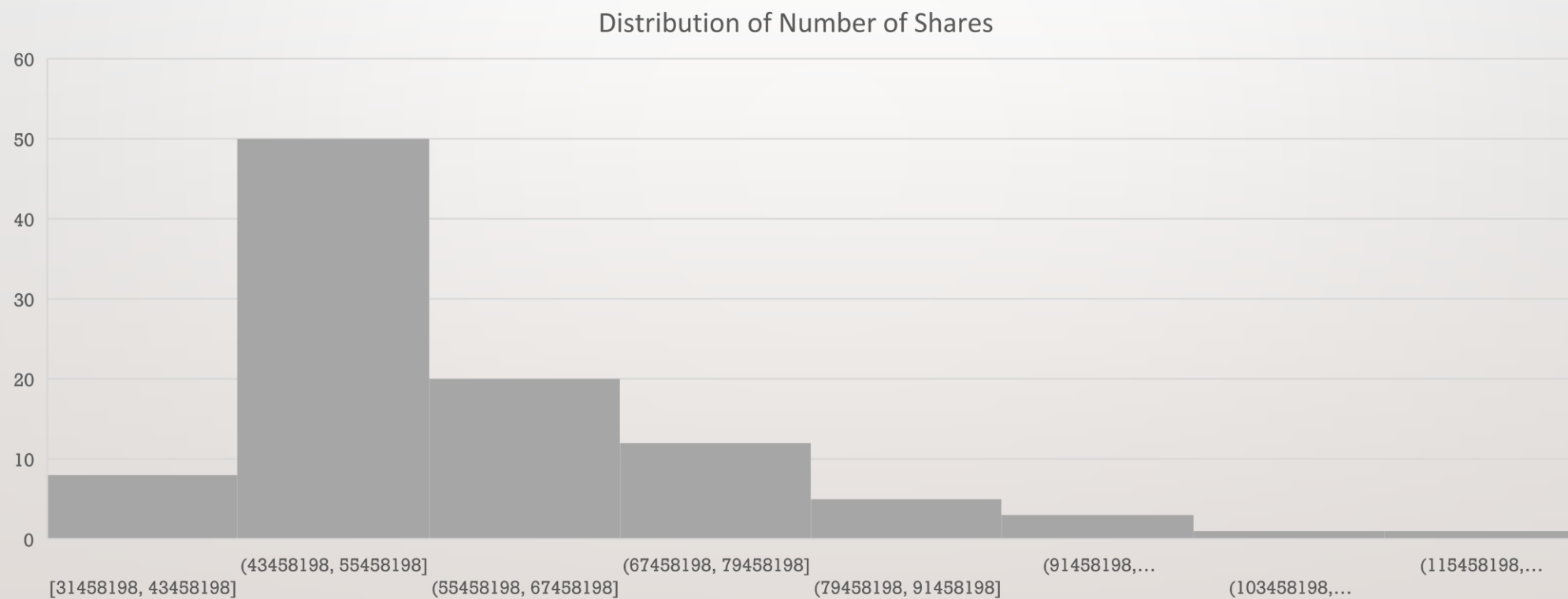# DISTRIBUTION OF VARIABLES
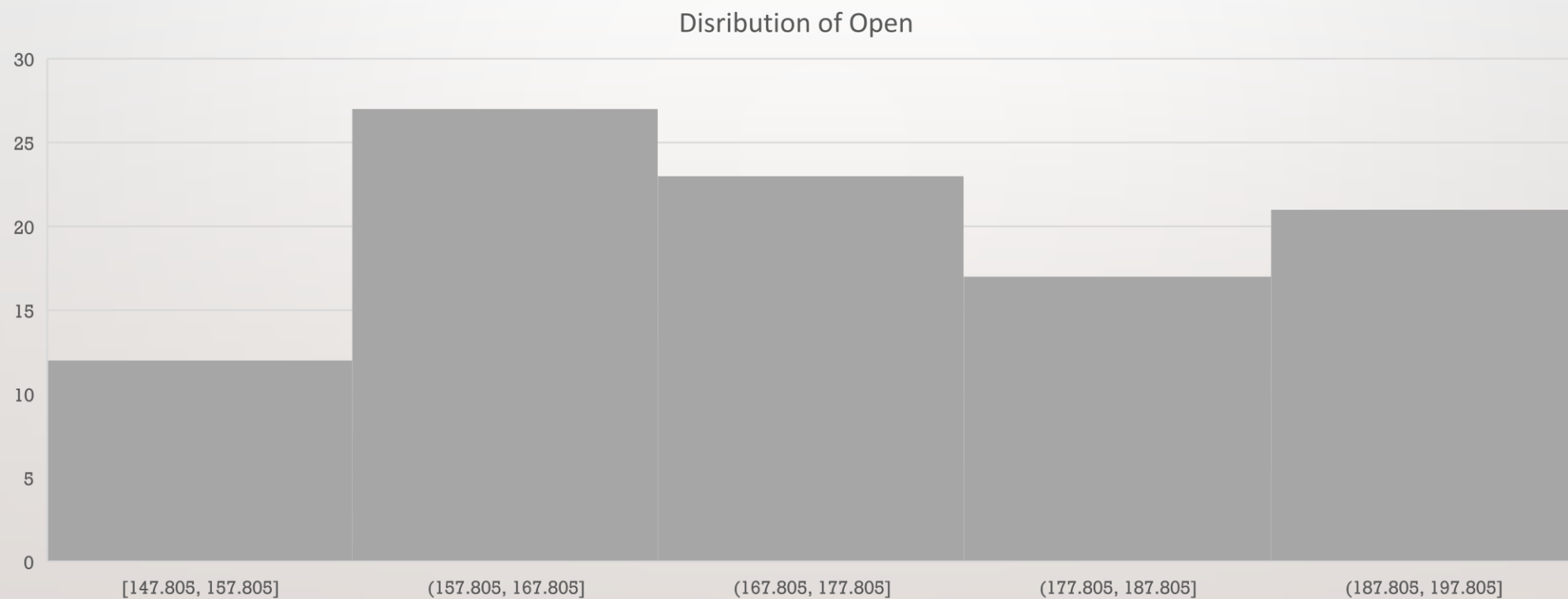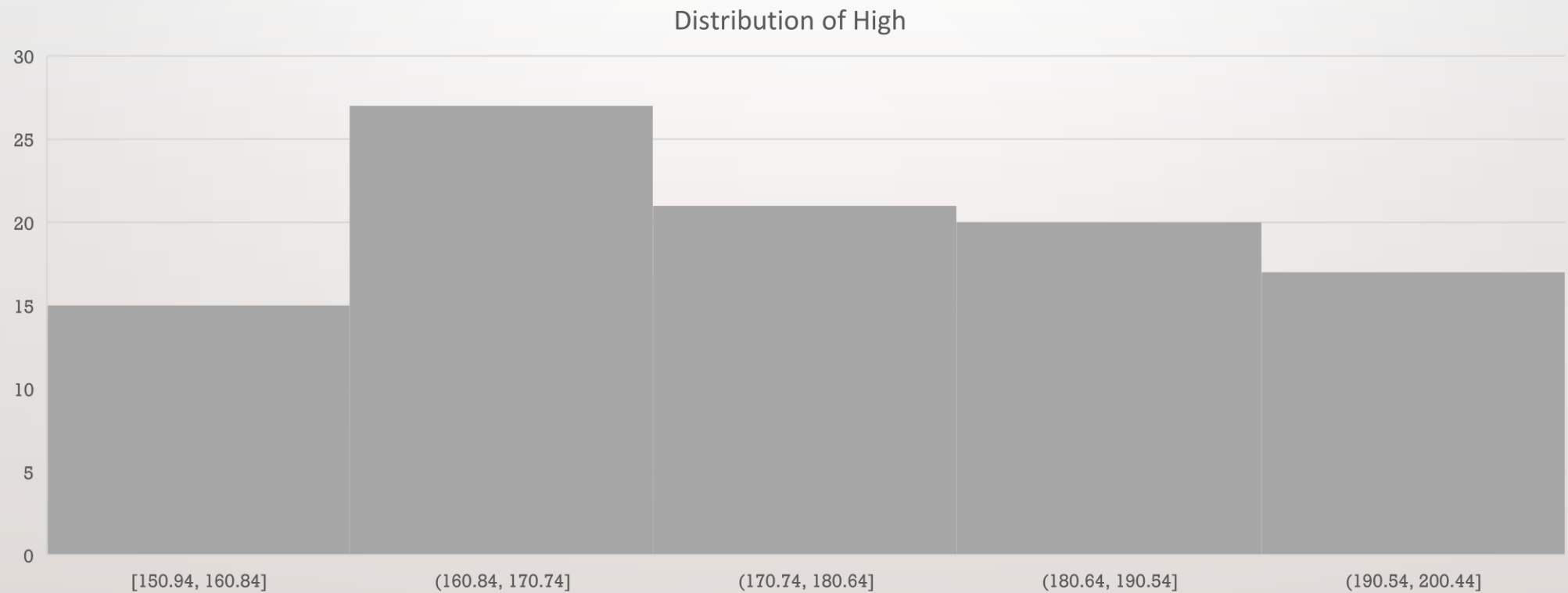
Distribution of Close

DISTRIBUTION OF VARIABLES

Distribution of Number of Shares
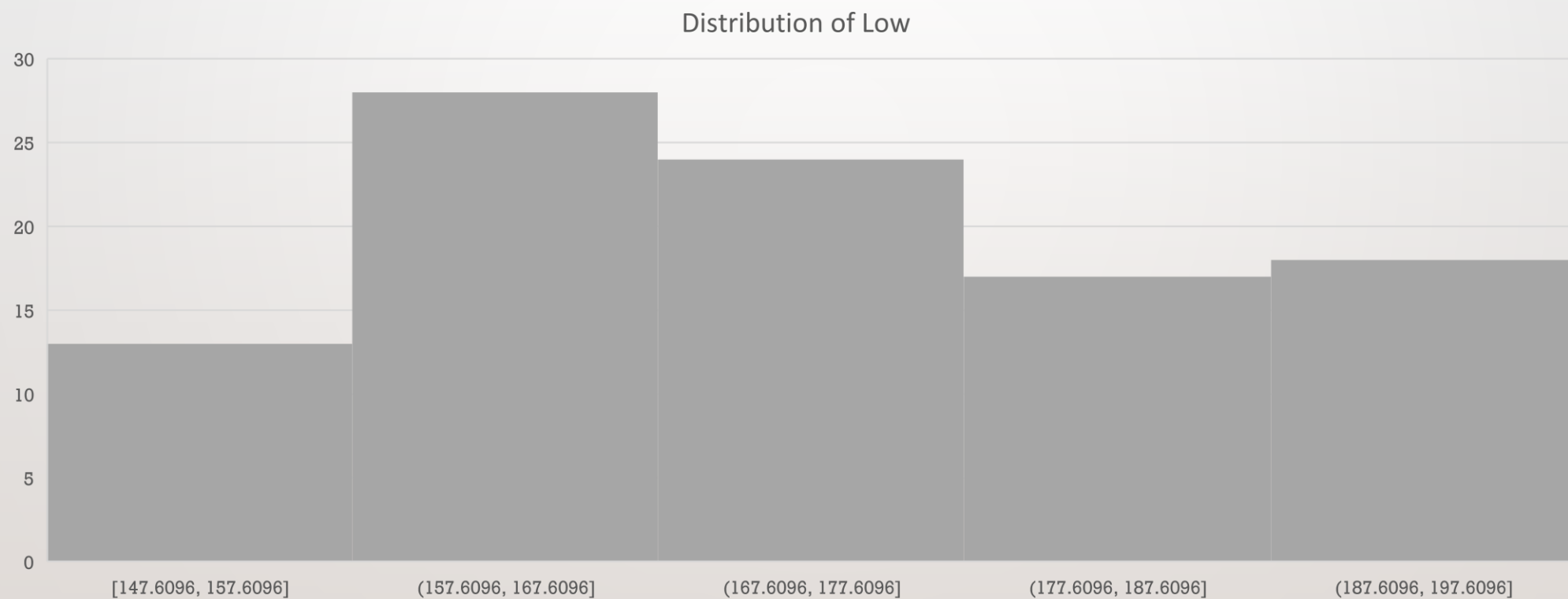
CORRELATION BETWEEN VARIABLES

- There is a very strong positive correlation between the "Open", "High", "Low", and "Close" columns, with correlation coefficients ranging from 0.993 to 0.997.

- This suggests that these variables are highly related to each other and tend to move in the same direction.

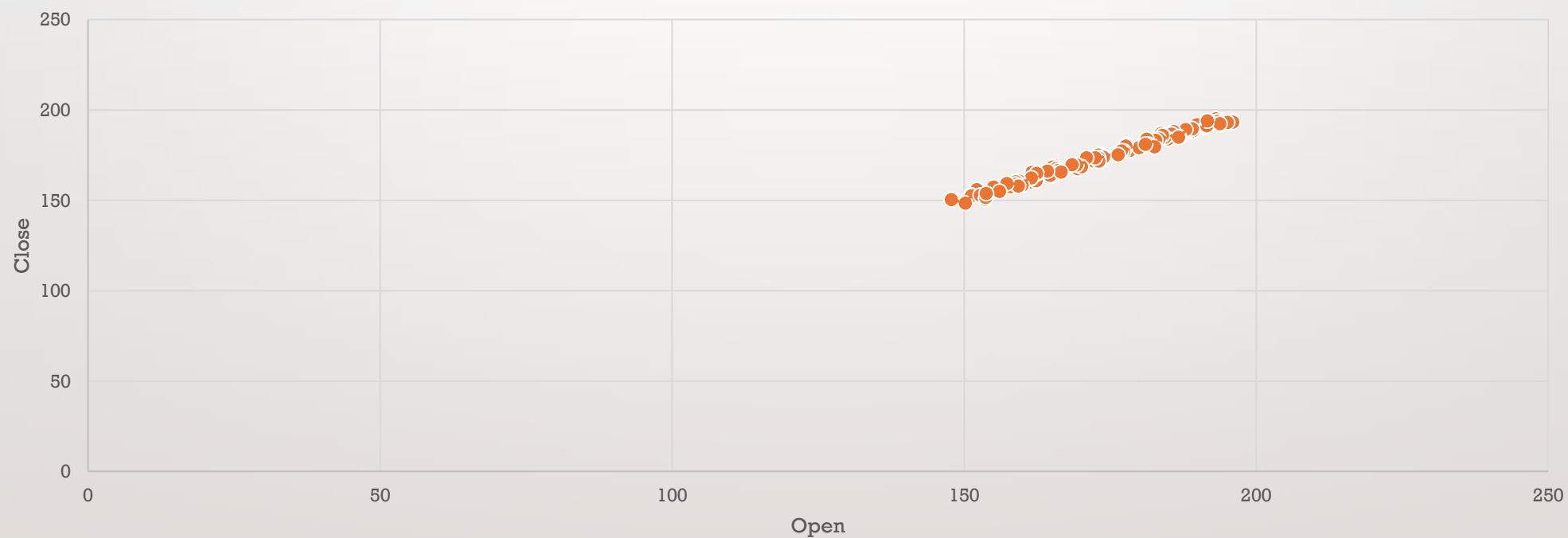|	Open	High	Low	Close	Volume
Open	1				
High	0.9966	1			
Low	0.9976	0.9972	1		
Close	0.993	0.9965	0.9973	1	
Volume	-0.196	-0.16	-0.204	-0.185	1

CORRELATION BETWEEN VARIABLES

- We can see that there is a weak negative correlation between the "Volume" column and the other columns, with correlation coefficients ranging from -0.16 to -0.2.

- This suggests that there is a weak relationship between the volume of trades and the stock prices. It means changes in trading volume don't have as much of an impact on the stock prices.

	Open	High	Low	Close	Volume
Open	1				
High	0.9966	1			
Low	0.9976	0.9972	1		
Close	0.993	0.9965	0.9973	1	
Volume	-0.196	-0.16	-0.204	-0.185	1

VISUAL REPRESENTATION OF CORRELATION

Field: Open and Field: High appear highly correlated.
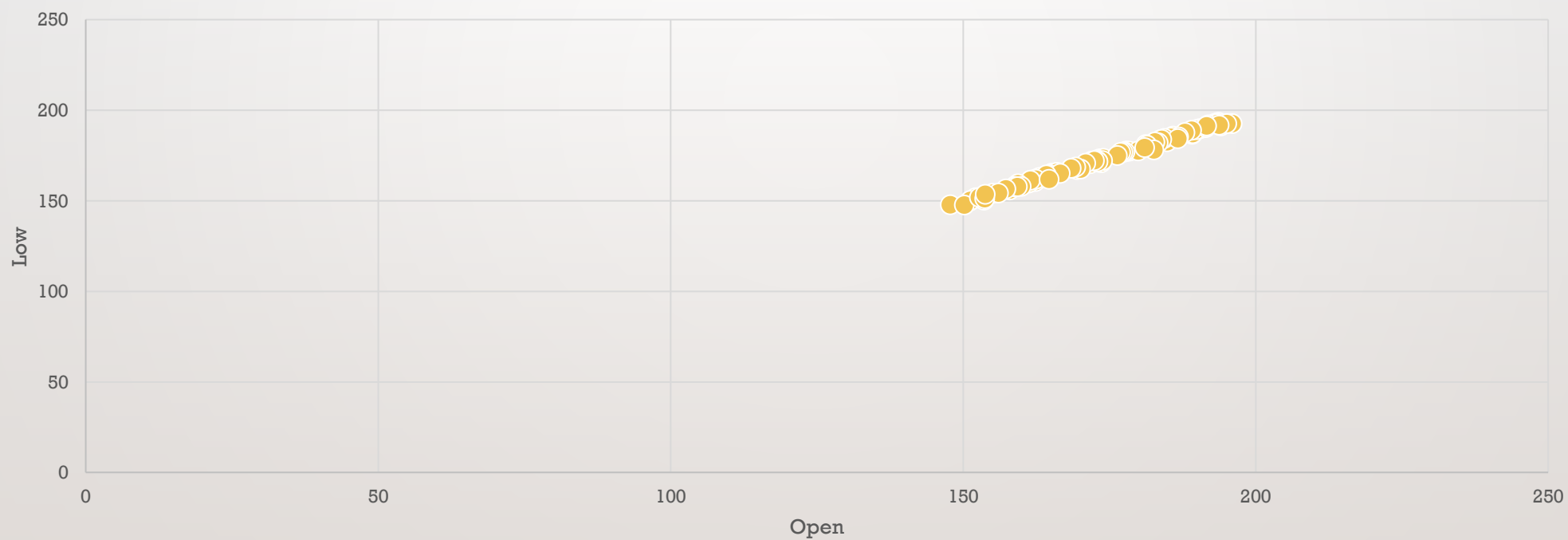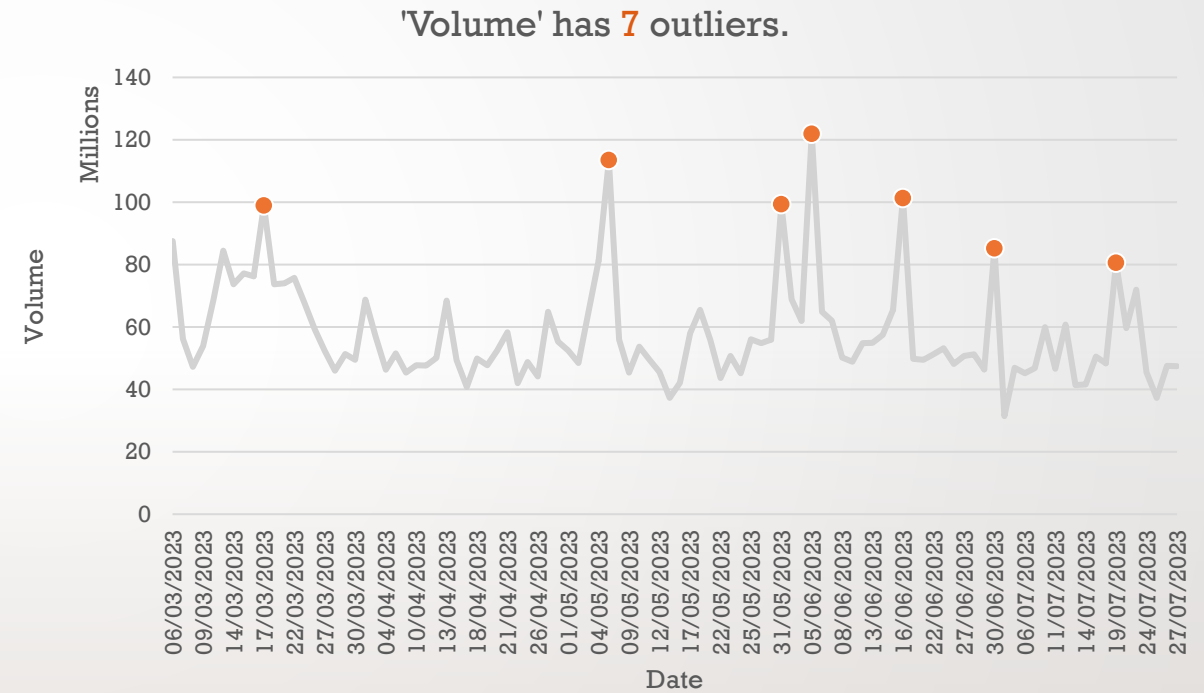
TREND ANALYSIS OF TIME-SERIES DATA

There is an increasing trend in stock prices of Apple products from Mar-2023 to July 2023

Open, High, Low, Close By Date

TREND ANALYSIS OF TIME-SERIES DATA

The majority number of shares which is volume is in the range from 43M to 80M.

PIVOT TABLE FOR EXAMINING AVERAGE PRICES AND VOLUME

- In Mar-2023 average prices are between $156- $158 and shares are 67M

- In Apr-2023 average prices are between $164- $166 and shares are 51M

- In May-2023 average prices are between $171- $174 and shares are 58M

- In Jun-2023 average prices are between $183 - $185 and shares are 62M

- In July-2023 average prices are between $191 - $194 and shares are 51M

Row Labels	Average Opening Price	Average Highest Price	Average Lowest Price	Average Closing Price	Average Total Number of Shares
⊞ Mar	USD 156	USD 158	USD 154	USD 156	67M
⊞ Apr	USD 164	USD 166	USD 164	USD 165	51M
⊞ May	USD 173	USD 174	USD 171	USD 173	58M
⊞ Jun	USD 184	USD 185	USD 183	USD 184	62M
⊞ Jul	USD 192	USD 194	USD 191	USD 192	51M

HYPOTHESIS TESTING

Hypothesis:

Is the opening price impact the number of shares?

Statistical Results:

Results are statistically significant. It rejects the null hypothesis

Interpretation:

Opening price has no impact on the number of shares.

t-Test: Two-Sample Assuming Unequal Variances

	Open	Number of shares
Mean	173.49374	58022825.93
Variance	174.6831261	2.62801E+14
Observations	100	99
Hypothesized Mean Difference	0	
df	98	
t Stat	-35.61244333	
P(T<=t) one-tail	3.54141E-58	
t Critical one-tail	1.660551217	
P(T<=t) two-tail	7.08282E-58	
t Critical two-tail	1.984467455	