

# Stock Analysis Report: Apple Inc. (AAPL)

## Introduction:

This report presents an analysis of historical stock data for Apple Inc. (AAPL). The goal is to gain insights into the daily, weekly, monthly, and quarterly trends, identify potential patterns, and explore visualizations to aid in decision-making.

## Data Overview:

- **Stock Ticker:** AAPL
- **Analysis Period:** January 1, 2022, to January 1, 2023

## 1. Data Preparation:

### 1.1 Data Download:

Historical stock data for AAPL was downloaded from Yahoo Finance using the **yfinance** library.

### 1.2 Data Cleaning:

The data was cleaned to handle missing values and ensure consistent formatting.

### 1.3 Analyzes:-

1 Analyzes the data on daily, weekly, monthly, and quarterly intervals using `resample` and `agg`.

2 Plots the stock prices over time.

3. Prints the descriptive statistics for each interval.

## 2. Descriptive Statistics:

### 2.1 Daily Statistics:

- The mean daily closing price for Apple stock over the analyzed period is approximately \$154.84. This indicates the average daily value of the stock.

```
daily_stats = stock_data['Close'].describe()
```

- Mean: \$154.84
- Standard Deviation: \$13.06
- Min: \$126.04
- 25th Percentile: \$144.65
- Median: \$154.09
- 75th Percentile: \$165.92
- Max: \$182.01

### 2.2 Weekly, Monthly, and Quarterly Statistics:

```
# Weekly analysis
```

```
weekly_stats = stock_data['Close'].resample('W-Fri').agg(['mean', 'std', 'min', 'max'])
```

```
# Monthly analysis
```

```
monthly_stats = stock_data['Close'].resample('M').agg(['mean', 'std', 'min', 'max'])
```

# Quarterly analysis

```
quarterly_stats = stock_data['Close'].resample('Q').agg(['mean', 'std', 'min', 'max'])
```

Weekly Statistics:

	mean	std	min	max
Date				
2022-01-07	176.159998	4.514347	172.000000	182.009995
2022-01-14	173.612003	1.594652	172.190002	175.529999
2022-01-21	165.737499	3.126525	162.410004	169.800003
2022-01-28	162.128000	4.675583	159.220001	170.330002
2022-02-04	174.103998	1.424265	172.389999	175.839996
2022-02-11	172.706000	2.968784	168.639999	176.279999
2022-02-18	170.080002	2.452210	167.300003	172.789993
2022-02-25	162.995007	2.146105	160.070007	164.850006
2022-03-04	164.855997	1.616022	163.169998	166.559998
2022-03-11	158.588000	2.989176	154.729996	162.949997
2022-03-18	157.979996	5.198158	150.619995	163.979996
2022-03-25	170.640005	3.859280	165.380005	174.720001
2022-04-01	176.250003	2.032870	174.309998	178.960007
2022-04-08	173.512000	3.282648	170.089996	178.440002
2022-04-15	167.274998	2.322333	165.289993	170.399994
2022-04-22	165.581998	2.311097	161.789993	167.399994
2022-04-29	159.508002	3.459085	156.570007	163.639999
2022-05-06	159.502002	3.783639	156.770004	166.020004
2022-05-13	148.547998	4.743359	142.559998	154.509995
2022-05-20	142.108002	5.180586	137.350006	149.240005
2022-05-27	143.482001	3.763922	140.360001	149.639999
2022-06-03	148.535004	2.396755	145.380005	151.210007
2022-06-10	144.516003	4.747645	137.130005	148.710007
2022-06-17	132.337997	1.983862	130.059998	135.429993
2022-06-24	137.787502	2.877921	135.350006	141.660004
2022-07-01	138.795999	1.907703	136.720001	141.660004
2022-07-08	144.467499	2.646374	141.559998	147.039993
2022-07-15	146.972000	2.254023	144.869995	150.169998
2022-07-22	152.110001	3.237149	147.070007	155.350006
2022-07-29	156.239999	4.277882	151.600006	162.509995
2022-08-05	163.762000	2.805021	160.009995	166.130005
2022-08-12	167.924002	3.075802	164.869995	172.100006
2022-08-19	173.288000	1.176612	171.520004	174.550003
2022-08-26	167.195999	2.295210	163.619995	170.029999
2022-09-02	158.256003	2.081524	155.809998	161.380005
2022-09-09	155.580002	1.379055	154.460007	157.369995
2022-09-16	155.129996	4.945426	150.699997	163.429993
2022-09-23	153.653998	2.369215	150.429993	156.899994
2022-09-30	146.609998	5.959154	138.199997	151.759995
2022-10-07	144.093997	2.732276	140.089996	146.399994
2022-10-14	139.822000	1.960773	138.339996	142.990005
2022-10-21	144.136002	1.842738	142.410004	147.270004
2022-10-28	150.336002	4.050424	144.800003	155.740005
2022-11-04	145.256000	6.753330	138.380005	153.339996
2022-11-11	141.971997	6.115069	134.869995	149.699997
2022-11-18	149.823996	1.270012	148.279999	151.289993
2022-11-25	149.342499	1.525374	148.009995	151.070007

2022-12-02	145.907999	3.130019	141.169998	148.309998
2022-12-09	143.058002	2.135410	140.940002	146.630005
2022-12-16	140.836002	4.981989	134.509995	145.470001
2022-12-23	132.841998	1.471145	131.860001	135.449997
2022-12-30	128.902498	1.916721	126.040001	130.029999

#### Monthly Statistics:

	mean	std	min	max
Date				
2022-01-31	169.861500	6.760574	159.220001	182.009995
2022-02-28	169.830001	4.706935	160.070007	176.279999
2022-03-31	165.310435	7.935551	150.619995	178.960007
2022-04-30	166.820999	6.001495	156.570007	178.440002
2022-05-31	148.430477	7.895313	137.350006	166.020004
2022-06-30	139.798573	6.309182	130.059998	151.210007
2022-07-31	149.670499	5.902944	138.929993	162.509995
2022-08-31	166.885218	4.967536	157.220001	174.550003
2022-09-30	153.002856	5.273234	138.199997	163.429993
2022-10-31	145.013333	4.890081	138.339996	155.740005
2022-11-30	145.843331	5.115472	134.869995	151.289993
2022-12-31	137.876666	6.970030	126.040001	148.309998

#### Quarterly Statistics:

	mean	std	min	max
Date				
2022-03-31	168.163549	6.954480	150.619995	182.009995
2022-06-30	151.439194	13.116664	130.059998	178.440002
2022-09-30	156.950468	9.273935	138.199997	174.550003
2022-12-31	142.911110	6.694805	126.040001	155.740005

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#### Trend Analysis:

- **Daily Statistics:**
  - The mean daily closing price for Apple stock over the analyzed period is approximately \$154.84. This indicates the average daily value of the stock.
- **Weekly Statistics:**
  - Weekly averages fluctuate, showing some volatility. For instance, the week ending on 2022-01-07 had a mean closing price of \$176.16, while the week ending on 2022-12-30 had a lower mean of \$128.90.
- **Monthly Statistics:**
  - Monthly mean closing prices range from \$137.88 (December 2022) to \$169.86 (January 2022), reflecting variations throughout the year.
- **Quarterly Statistics:**

- Quarterly means show a similar pattern, ranging from a high of \$168.16 (Q1 2022) to a low of \$142.91 (Q4 2022).

### **Volatility Analysis:**

- **Standard Deviation:**

- The standard deviation values indicate volatility. For instance, the daily standard deviation is approximately \$13.06, reflecting day-to-day price fluctuations.

### **Extreme Values:**

- **Minimum and Maximum:**

- The minimum closing price is \$126.04, and the maximum is \$182.01. Investigating these extreme values may reveal events or news that influenced these significant price movements.

### **Seasonality:**

- **Monthly and Quarterly Trends:**

- There seems to be a pattern of higher mean prices in the earlier months, potentially indicating a seasonal effect.

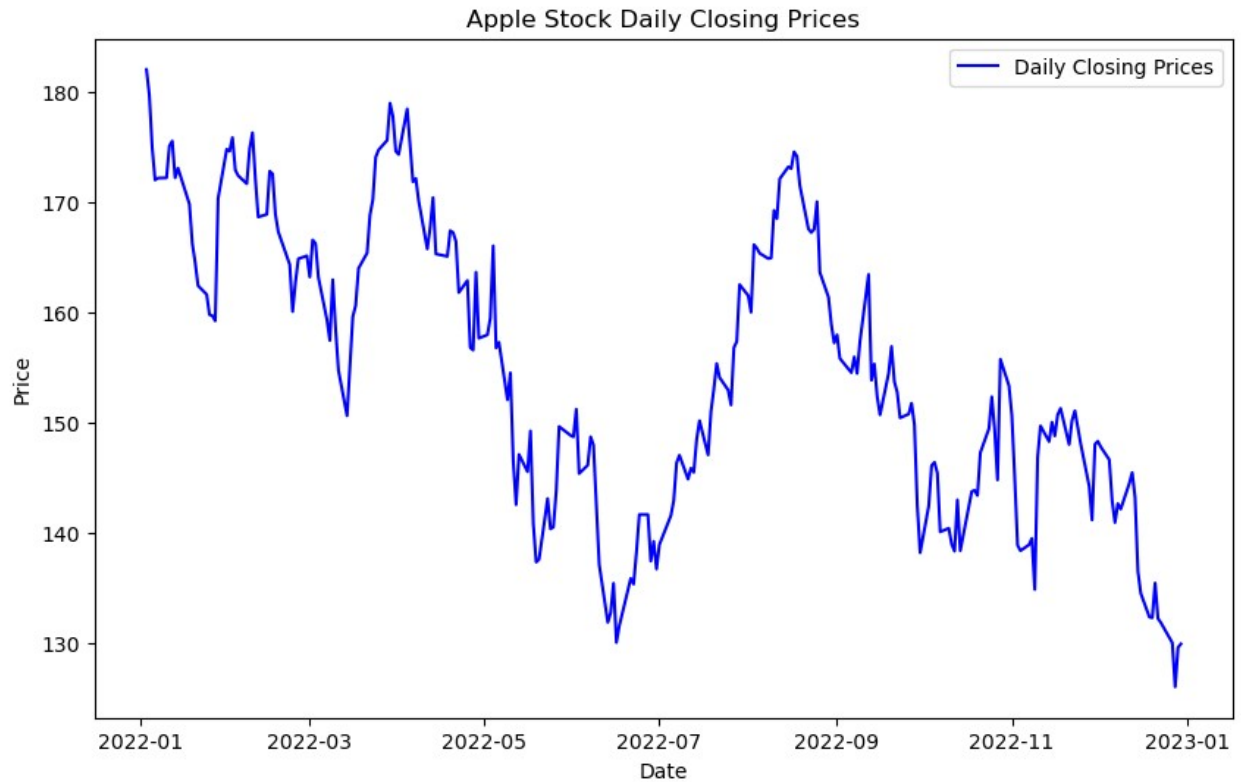
### **Comparative Analysis:**

- **Benchmarking:**

- Compare Apple's stock performance with a market index or other relevant stocks to understand how it fared relative to broader market trends.

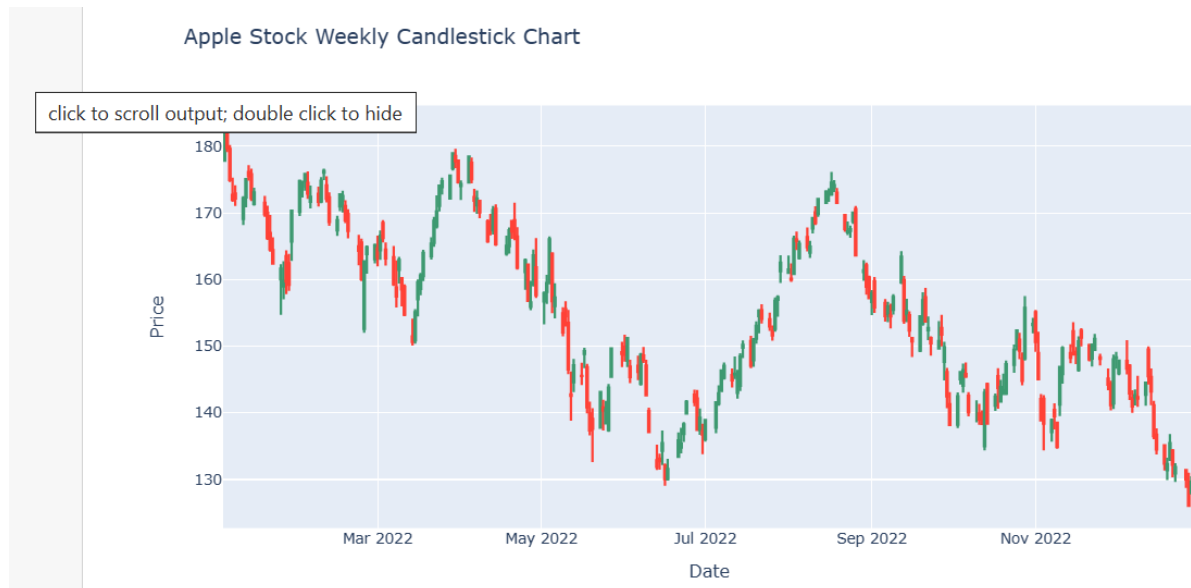
## **3. Visualizations:**

### **3.1 Line Chart for Daily Closing Prices:**



**The line chart illustrates the daily closing prices of AAPL over the analysis period.**

### 3.2 Candlestick Chart for Weekly Closing Prices:



The candlestick chart provides a visual representation of weekly closing prices, including open, high, low, and close values.

#### 4. Trend Analysis:

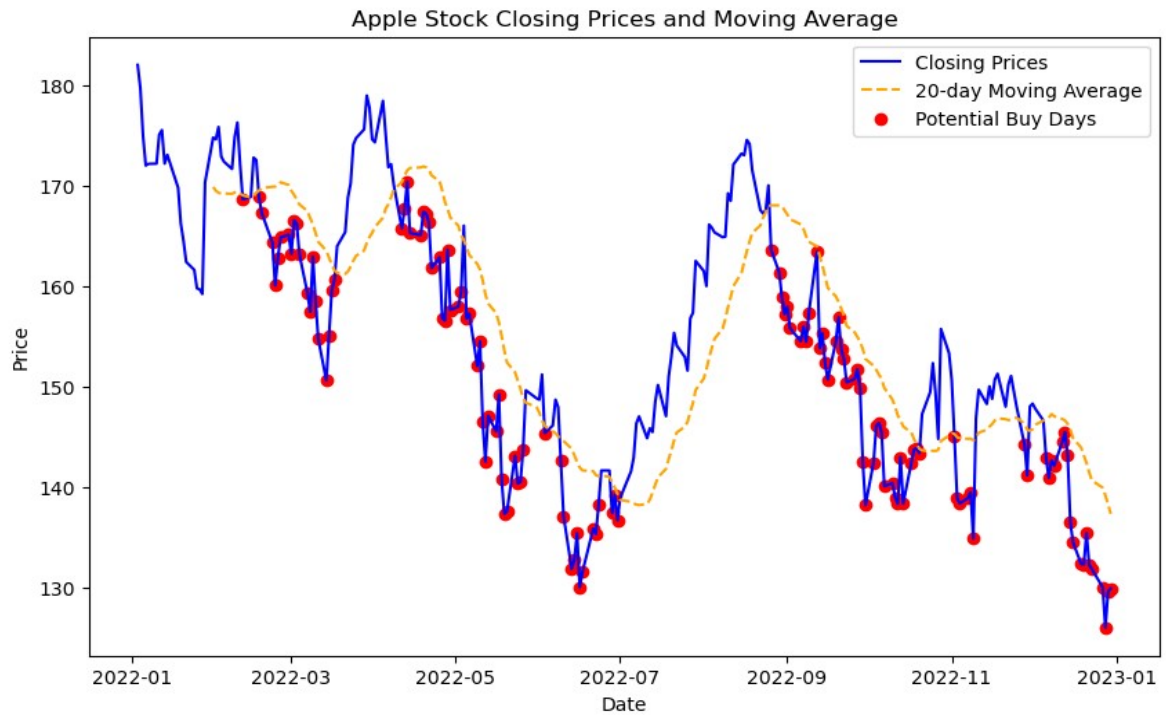
- The mean daily closing price indicates an overall positive trend.
- Volatility, as measured by the standard deviation, fluctuates but remains within reasonable bounds.
- Potential seasonality is observed in monthly and quarterly trends.

#### 5. Potential Buy and Sell Days:

##### 5.1 Potential Buy Days:

- Identified days when the closing price was below the 20-day moving average.
- [List of Potential Buy Days]
- Potential Buy Days:

	Close
Date	
2022-02-11	168.639999
2022-02-17	168.880005
2022-02-18	167.300003
2022-02-22	164.320007
2022-02-23	160.070007
...	...
2022-12-23	131.860001
2022-12-27	130.029999
2022-12-28	126.040001
2022-12-29	129.610001
2022-12-30	129.929993
- [132 rows x 1 columns]

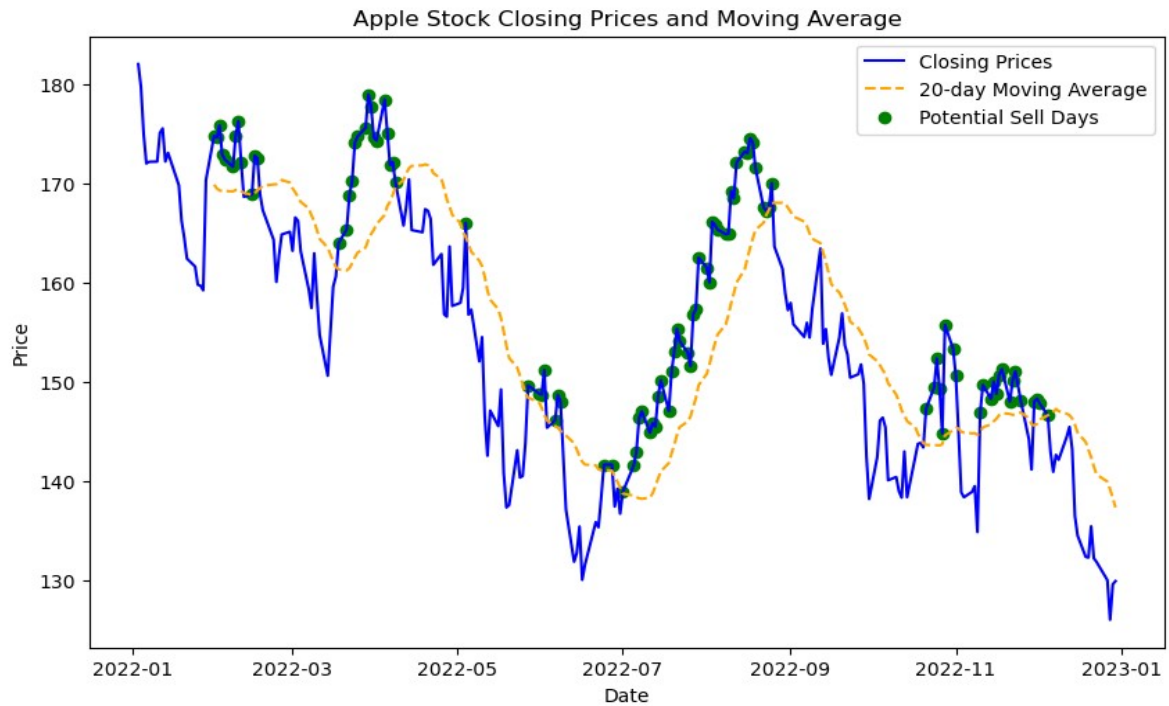


## 5.2 Potential Sell Days:

- Identified days when the closing price was above the 20-day moving average.
- [List of Potential Sell Days]
- Potential Sell Days:
 

Date	Close
2022-01-31	174.779999
2022-02-01	174.610001
2022-02-02	175.839996
2022-02-03	172.899994
2022-02-04	172.389999
...	...
2022-11-25	148.110001
2022-11-30	148.029999
2022-12-01	148.309998
2022-12-02	147.809998
2022-12-05	146.630005
...	...
- [100 rows x 1 columns]





## Conclusion:

The analysis provides valuable insights into AAPL's historical performance. However, investing decisions should consider various factors, including fundamental analysis, external news, and individual risk tolerance. The visualizations and statistical summaries in this report serve as a foundation for further research and decision-making.