

# Stock Analysis

February 5, 2024

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[15]: #Current Date - 02/05/2024
import pandas as pd
import yfinance as yf
import plotly.express as px
from datetime import datetime
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[2]: start_date = datetime.now() - pd.DateOffset(months=12)
end_date = datetime.now()
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[3]: tickers = ['AAPL', 'SPY']
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[4]: df_list = []

for ticker in tickers:
    data = yf.download(ticker, start=start_date, end=end_date)
    df_list.append(data)
df = pd.concat(df_list, keys=tickers, names=['Ticker', 'Date'])

df = df.reset_index() # we have to reset index

print(df.head(10))
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	Ticker	Date	Open	High	Low	Close \
0	AAPL	2023-02-06	152.570007	153.100006	150.779999	151.729996
1	AAPL	2023-02-07	150.639999	155.229996	150.639999	154.649994
2	AAPL	2023-02-08	153.880005	154.580002	151.169998	151.919998
3	AAPL	2023-02-09	153.779999	154.330002	150.419998	150.869995
4	AAPL	2023-02-10	149.460007	151.339996	149.220001	151.009995
5	AAPL	2023-02-13	150.949997	154.259995	150.919998	153.850006
6	AAPL	2023-02-14	152.119995	153.770004	150.860001	153.199997
7	AAPL	2023-02-15	153.110001	155.500000	152.880005	155.330002
8	AAPL	2023-02-16	153.509995	156.330002	153.350006	153.710007
9	AAPL	2023-02-17	152.350006	153.000000	150.850006	152.550003

	Adj Close	Volume
0	150.886597	69858300

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1  153.790390  83322600
2  151.075546  64120100
3  150.031387  56007100
4  150.399887  57450700
5  153.228439  62199000
6  152.581055  61707600
7  154.702454  65573800
8  153.088989  68167900
9  151.933685  59144100

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[5]: fig = px.line(df, x= 'Date',
                  y='Close',
                  color='Ticker',
                  title="Stock Market Performance for the Past Year")
fig.show()

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[6]: fig = px.area(df, x='Date', y='Close',
                  facet_col='Ticker',
                  labels={'Date': 'Date', 'Close': 'Closing Price', 'Ticker':
↪ 'Company'},
                  title='Stock Prices for Apple compared to the S&P 500')
fig.show()

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[7]: df['MA10'] = df.groupby('Ticker')['Close'].rolling(window=10).mean().
↪ reset_index(0, drop=True)
df['MA20'] = df.groupby('Ticker')['Close'].rolling(window=30).mean().
↪ reset_index(0, drop=True)

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[8]: df['Volatility'] = df.groupby('Ticker')['Close'].pct_change().
↪ rolling(window=10).std().reset_index(0, drop=True)
fig = px.line(df, x='Date', y='Volatility',
              color='Ticker',
              title='Volatility between AAPL and SPY Tickers')
fig.show()
#Worth noting that AAPL is in the S&P 500 Index Fund (and Stocks in the S&P are
↪ not equally weighted, so AAPL
#does have a big impact) but still worth reviewing as other companies are a
↪ part of that Fund.
#Helps show how the health of the market partially impacts a company's stock.

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[9]: # create a DataFrame with the stock prices of Apple and SPY
apple = df.loc[df['Ticker'] == 'AAPL', ['Date', 'Close']].
↪ rename(columns={'Close': 'AAPL'})
google = df.loc[df['Ticker'] == 'SPY', ['Date', 'Close']].
↪ rename(columns={'Close': 'SPY'})
df_corr = pd.merge(apple, google, on='Date')

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# create a scatter plot to visualize the correlation
fig = px.scatter(df_corr, x='AAPL', y='SPY',
                 trendline='ols',
                 title='Correlation between Apple and S&P 500')
fig.show()
```

```
[10]: #Now to focus on Apple to see what a good entry point may be by determining max/
      ↪min for year
df_list = []
data = yf.download("AAPL", start=start_date, end=end_date)
df_list.append(data)
df = pd.concat(df_list, keys=tickers, names=['Ticker', 'Date'])

df = df.reset_index()
```

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[11]: print("Past Year")
      print("Highest Value")
      print(df.max())

      print("Lowest Value")
      print(df.min())
```

```
Past Year
Highest Value
Ticker          AAPL
Date            2024-02-02 00:00:00
Open            198.020004
High            199.619995
Low             197.0
Close           198.110001
Adj Close       198.110001
Volume          128256700
dtype: object
Lowest Value
Ticker          AAPL
Date            2023-02-06 00:00:00
Open            144.380005
High            146.710007
Low             143.899994
Close           145.309998
Adj Close       144.722946
Volume          24048300
dtype: object
```

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[12]: #Narrowing down to this past half month for a realistic call option strike
      ↪price to purchase
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[13]: start_date = datetime.now() - pd.DateOffset(weeks=2)
      end_date = datetime.now()
      df_list = []
      data = yf.download("AAPL", start=start_date, end=end_date)
      df_list.append(data)
      df = pd.concat(df_list, keys=tickers, names=['Ticker', 'Date'])

      df = df.reset_index()
      print("Past Month")
      print("Highest Value")
      print(df.max())

      print("Lowest Value")
      print(df.min())
```

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Past Month

Highest Value

Ticker	AAPL
Date	2024-02-02 00:00:00
Open	195.419998
High	196.380005
Low	194.339996
Close	195.179993
Adj Close	195.179993
Volume	102518000

dtype: object

Lowest Value

Ticker	AAPL
Date	2024-01-22 00:00:00
Open	179.860001
High	186.949997
Low	179.25
Close	184.399994
Adj Close	184.399994
Volume	42355600

dtype: object

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[14]: #Given the gradual increase, a solid strike price may be $195-$199 based on
      ↪expiration date
      #Based on the data above, while short term holdings may not be encouraged based
      ↪on
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#market volatility, both SPY and AAPL specifically would be great holds long  
↳ term
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[ ]:
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