LUNAR PHASES AND STOCK BEHAVIOR 🌛 📈

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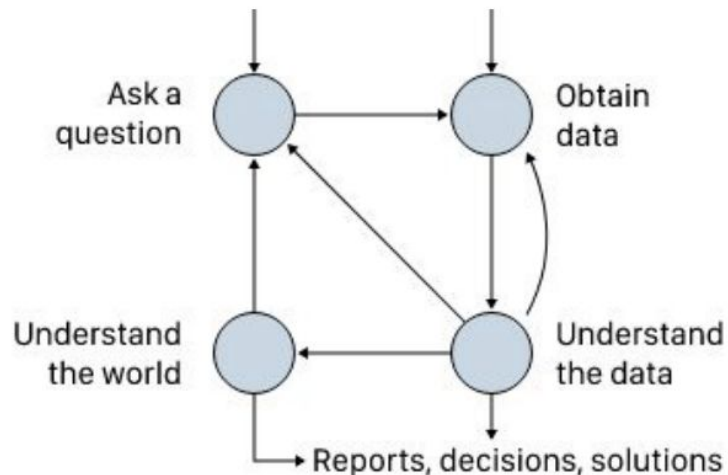Emilio Kiryakos - ekirya2@uic.edu - ekir999
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The Big Idea, What do we want to know? 💡

"Does a correlation between the phases of the moon and behavior of a stock exist?"

Lunar Data:
- Phase of Moon
- Date

Stock Data collected
- Day open
- Day close
- Day High
- Day Low
- Volume
- VWAP
- Date&Time

The Data Acquisition and Cleaning

Collected 5 individual sets of data for Stocks
- Apple
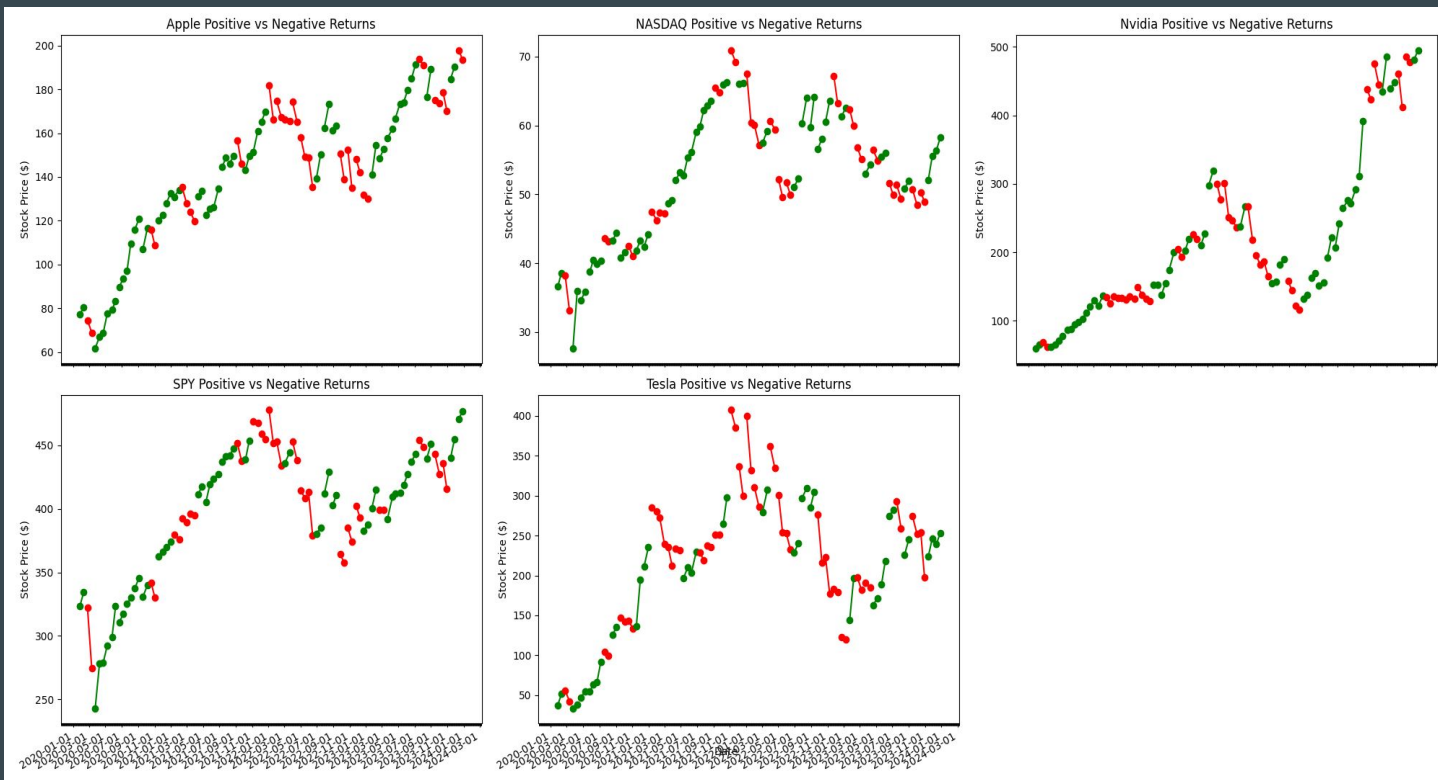- Tesla
- NVIDIA
- SPY
- NASDAQ

Limited to 4 years of data

- Choose a consistent time frame 01-01-2020 -> 01-01-2024 removing other values
- Merged data sets on date

Solution 📋

We each decided to break up explorations and visualizations investigating different areas of data that would that would help support or debunk our hypothesis
1) Returns over lunar cycles (New Moon to Full Moon)
2) Stock Volume vs Stock Price Correlation
3) Volatility and Profitability during a New Moon and Full Moon
4) ML Correlation Tesla Stock Price VS Lunar
5) Investigating the Influence of Lunar Cycles VS Apple Stock Behavior using ML

Findings - Returns Over Lunar Cycle 📈

Apple:
61.22% positive returns
+$548.22

Nasdaq
59.18% positive returns
+$408.97

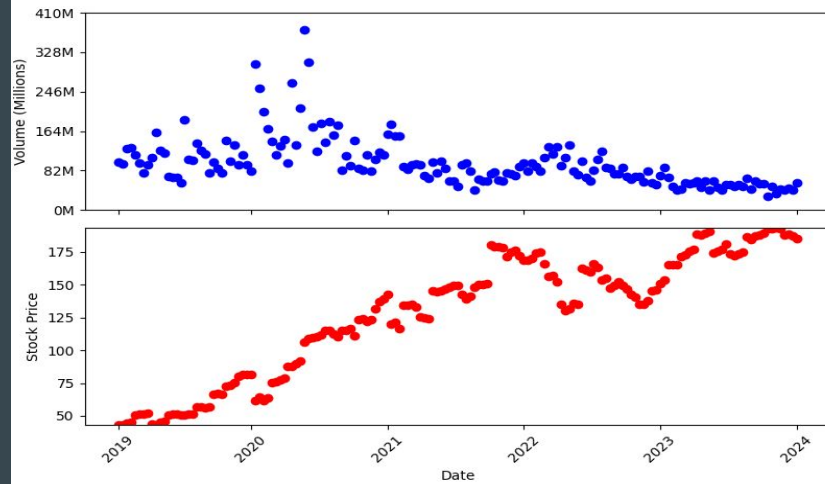**Spy**
61.22% positive returns
+$190.28
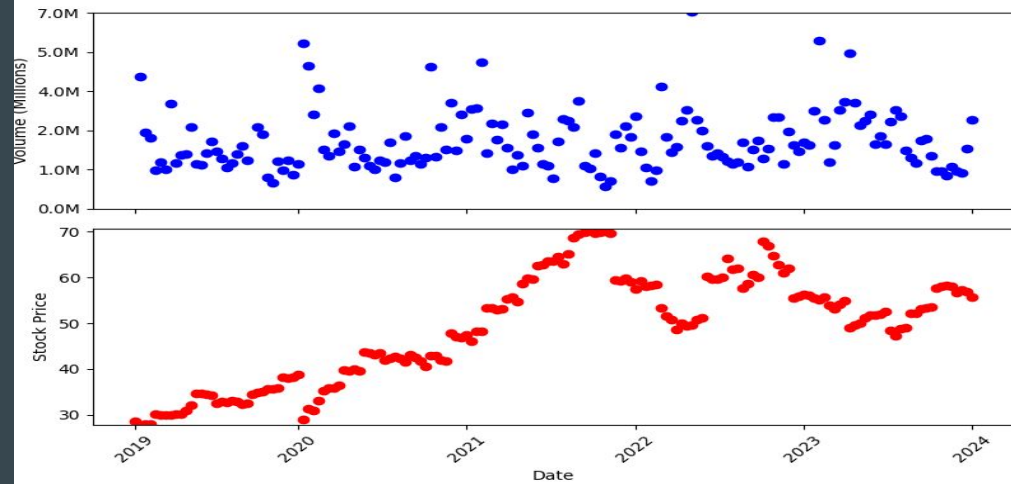
Nvidia
57.14% positive returns
+$828.56

Tesla
44.90% positive returns
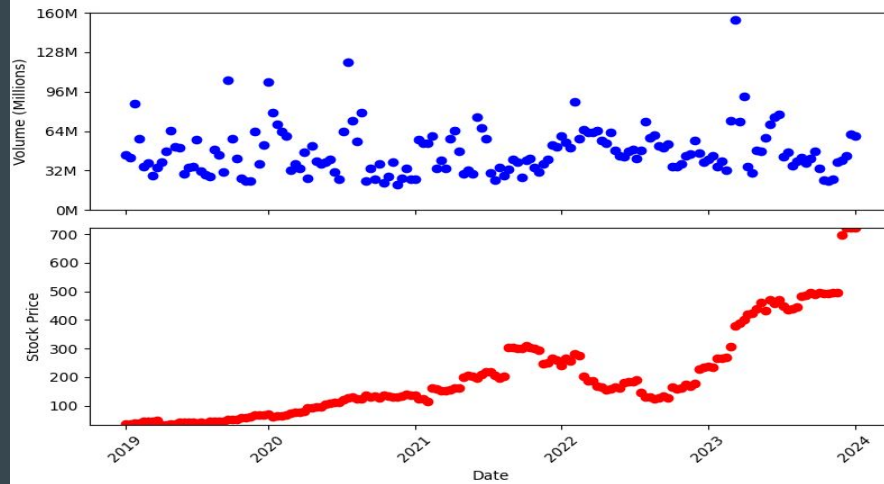+$861.46

Avg 56% of lunar cycles
had positive returns

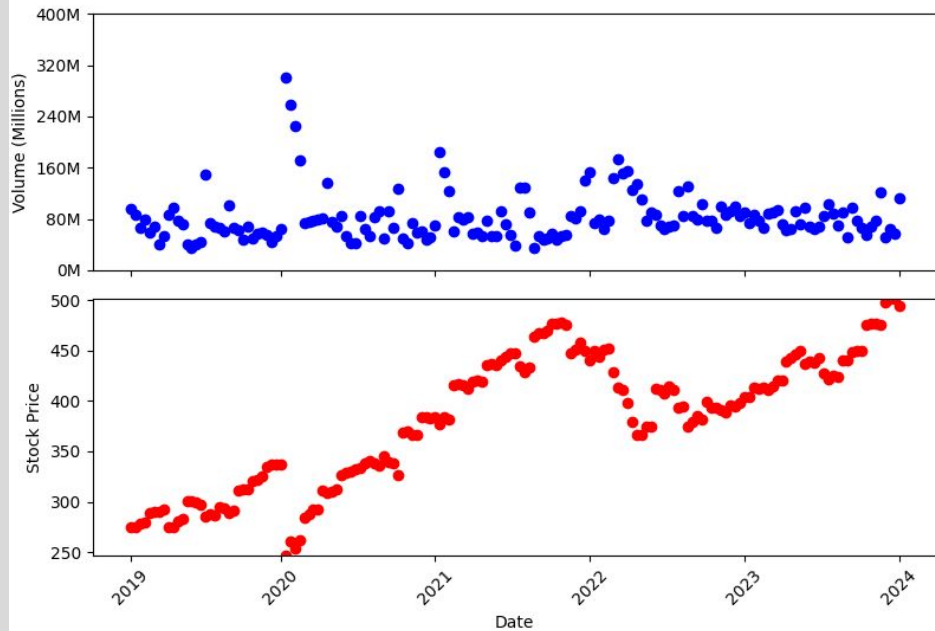Apple's Stock Volume and Price during New Moon Phase

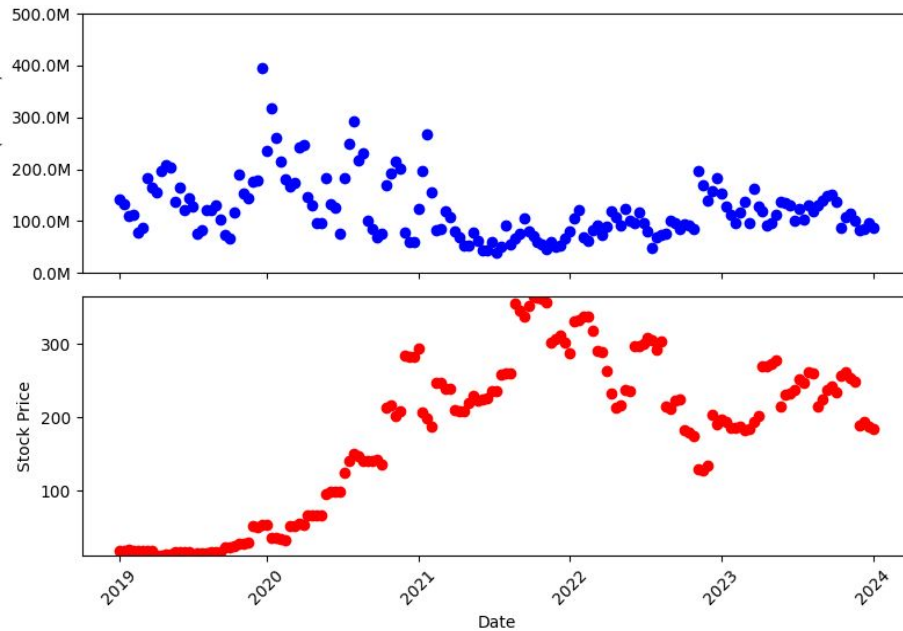NASDAQ's Stock Volume and Price during New Moon Phase

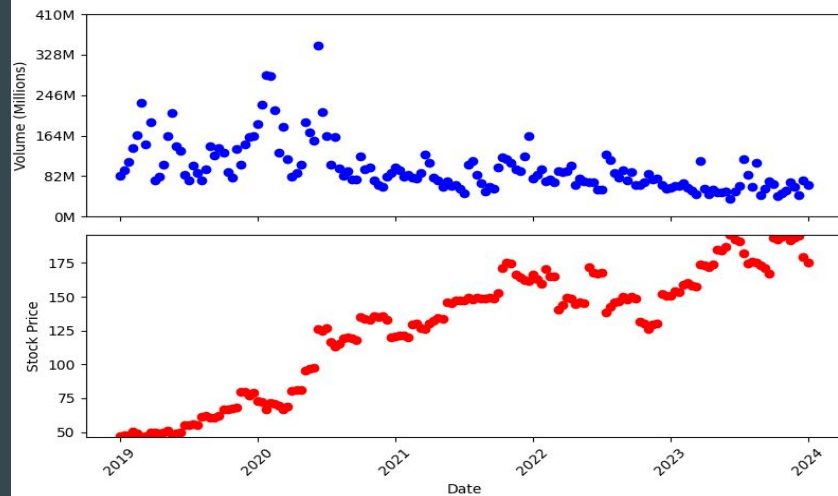NVIDIA's Stock Volume and Price during New Moon Phase

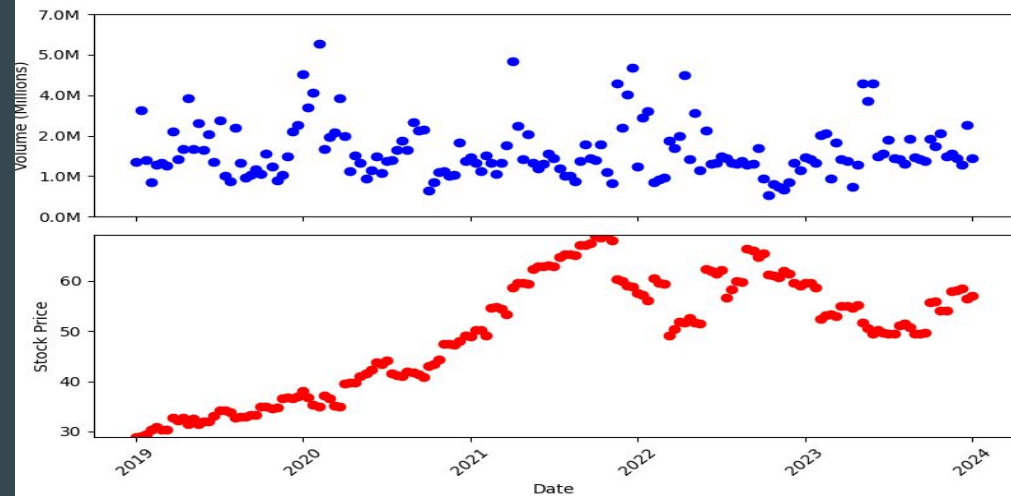SPY's Stock Volume and Price during New Moon Phase

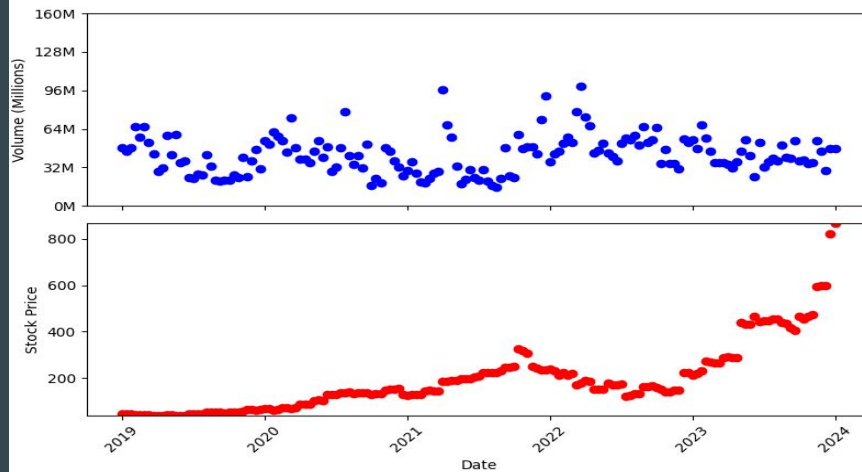Tesla's Stock Volume and Price during New Moon Phase

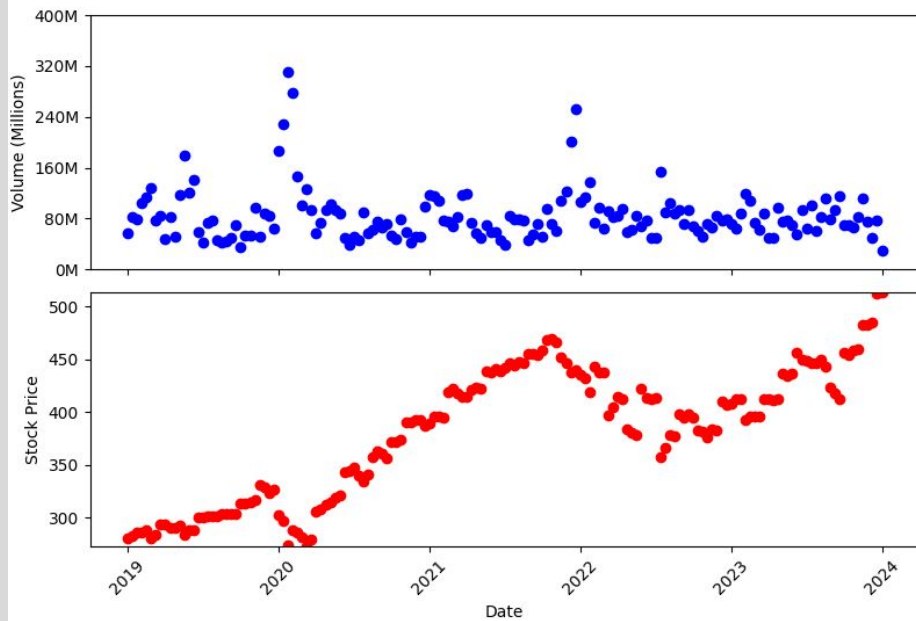Apple's Stock Volume and Price during Full Moon Phase

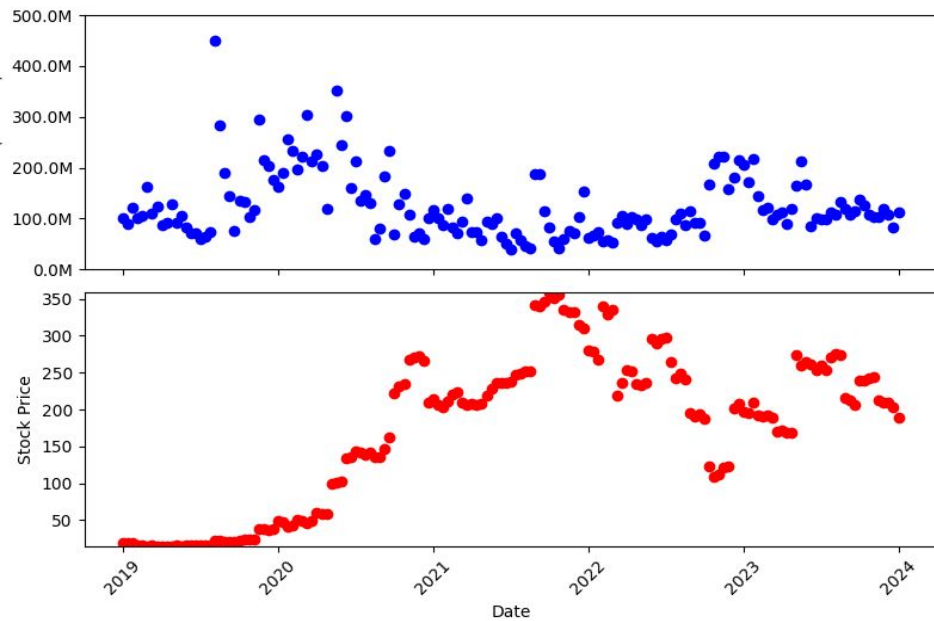NASDAQ's Stock Volume and Price during Full Moon Phase

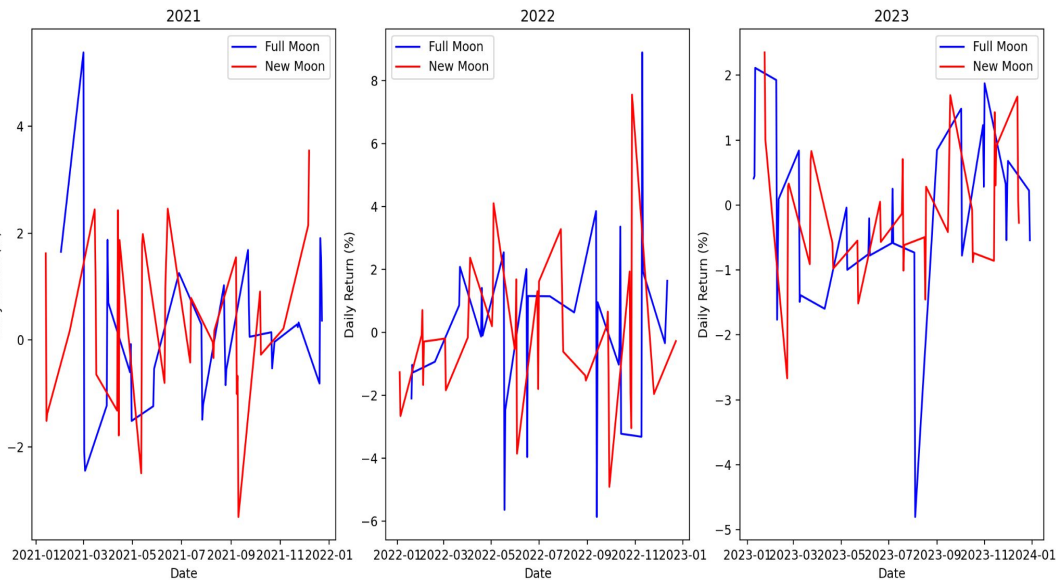NVIDIA's Stock Volume and Price during Full Moon Phase

SPY's Stock Volume and Price during Full Moon Phase

Tesla's Stock Volume and Price during Full Moon Phase

APPLE Stock New and Full Moon Returns (2021-2023)
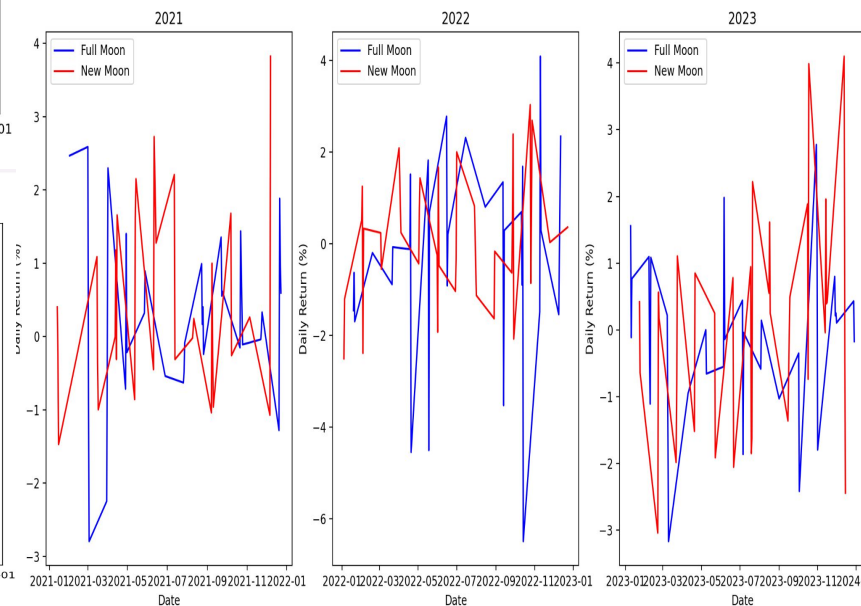
NVIDIA Stock New and Full Moon Returns (2021-2023)
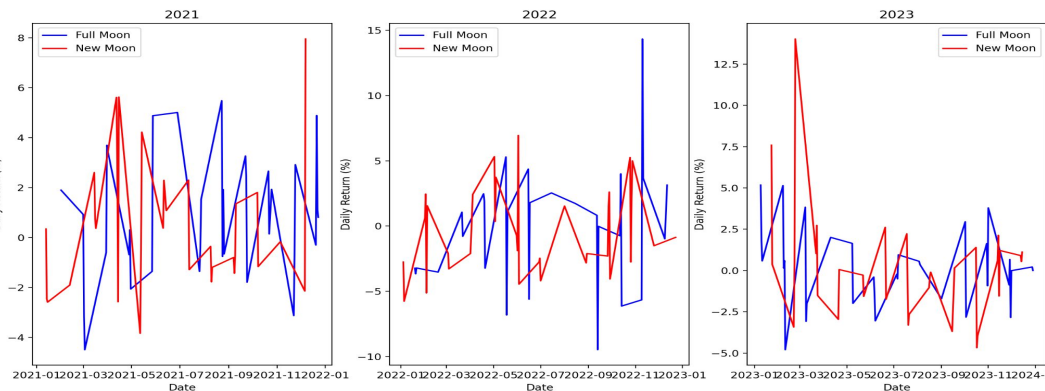
NASDAQ Stock New and Full Moon Returns (2021-2023)

What is happening inside each full and new moon cycle?

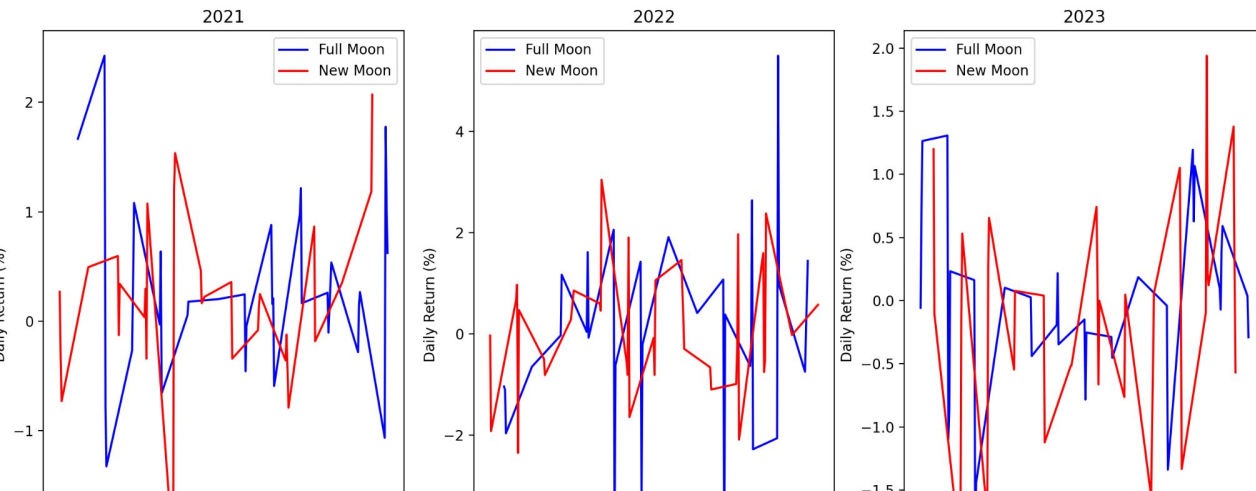https://www.quantifiedstrategies.com/full-moon-moon-phases-lunar-cycles-trading-strategies/

SPY Stock New and Full Moon Returns (2021-2023)

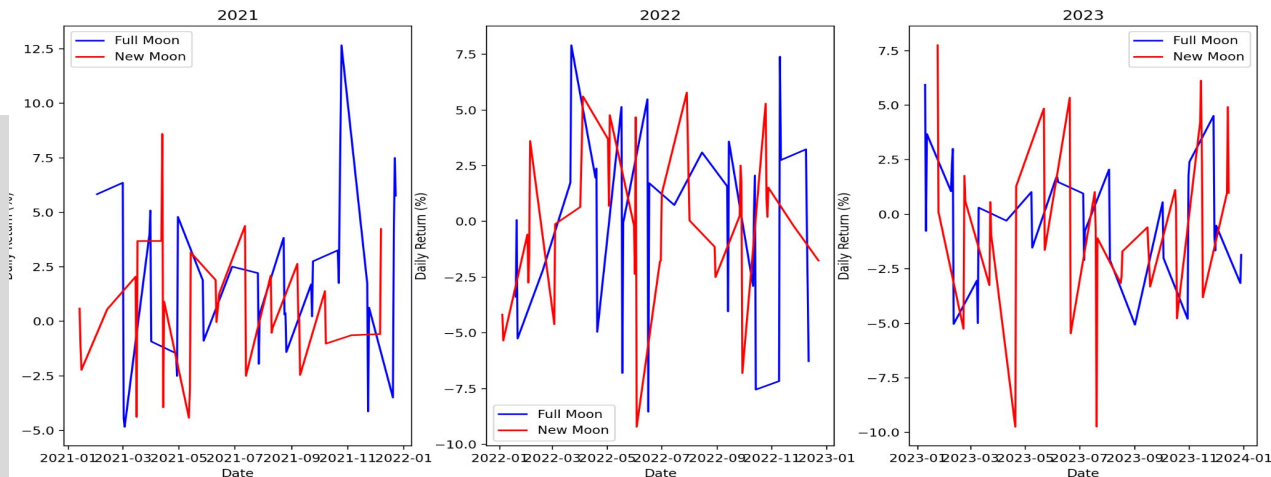TESLA Stock New and Full Moon Returns (2021-2023)

NVIDIA
Full Moon Average Returns = 0.28%
New Moon Average Returns = 0.10%
NASDAQ
Full Moon Average Returns = -0.04%
New Moon Average Returns = 0.20%
SPY
Full Moon Average Returns = 0.05%
New Moon Average Returns = 0.04%
TESLA
Full Moon Average Returns = 0.56%
New Moon Average Returns = -0.02%
APPLE
Full Moon Average Returns = 0.00%
New Moon Average Returns = 0.04%

NVIDIA
Full Moon Average Percent Change: 0.4033%
New Moon Average Percent Change: 0.33%
NASDAQ
Full Moon Average Percent Change: 0.22%
New Moon Average Percent Change: 0.1967%
SPY
Full Moon Average Percent Change: 0.1467%
New Moon Average Percent Change: 0.12%
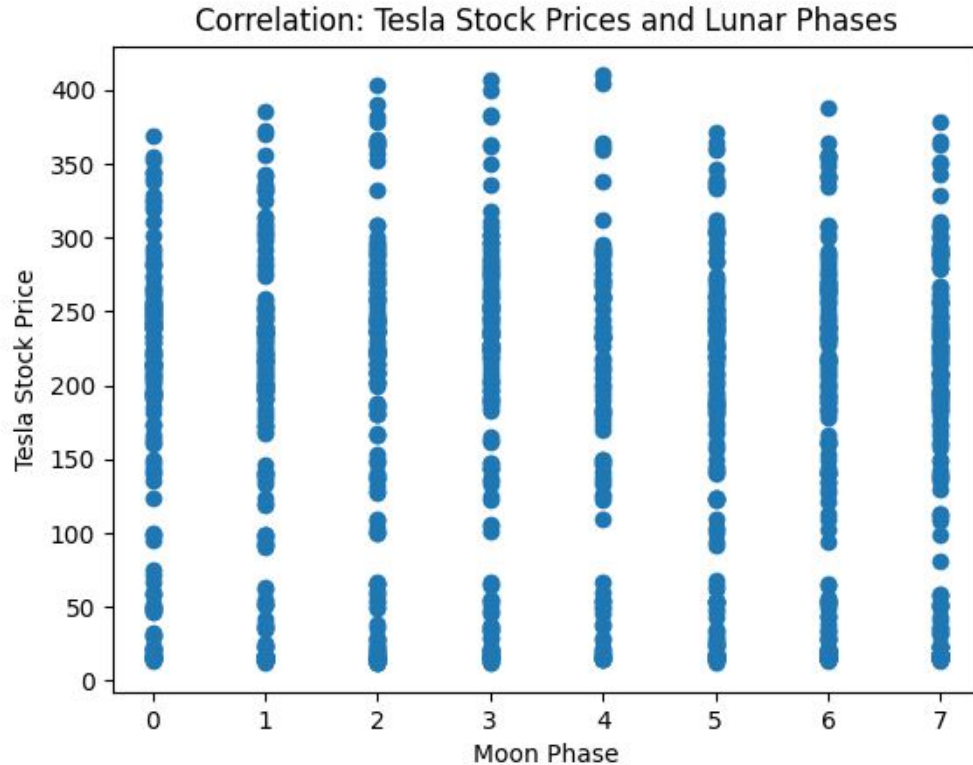TESLA
Full Moon Average Percent Change: 1.03%
New Moon Average Percent Change: 0.33%
APPLE
Full Moon Average Percent Change: 0.1%
New Moon Average Percent Change: 0.18%

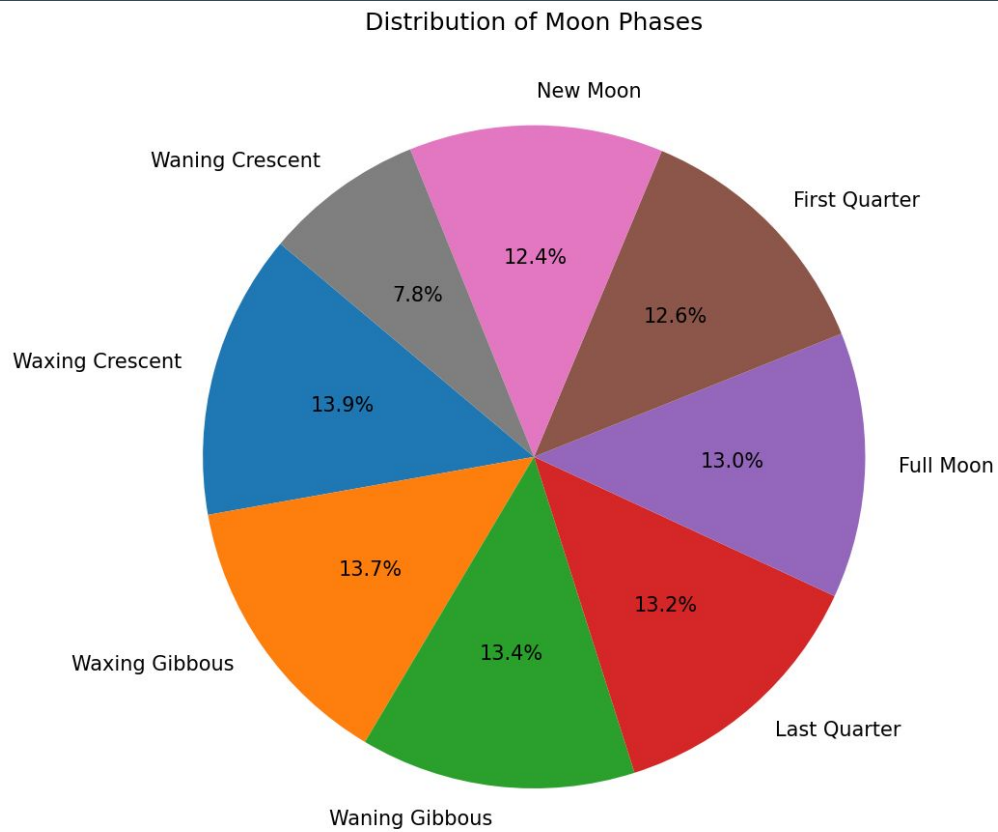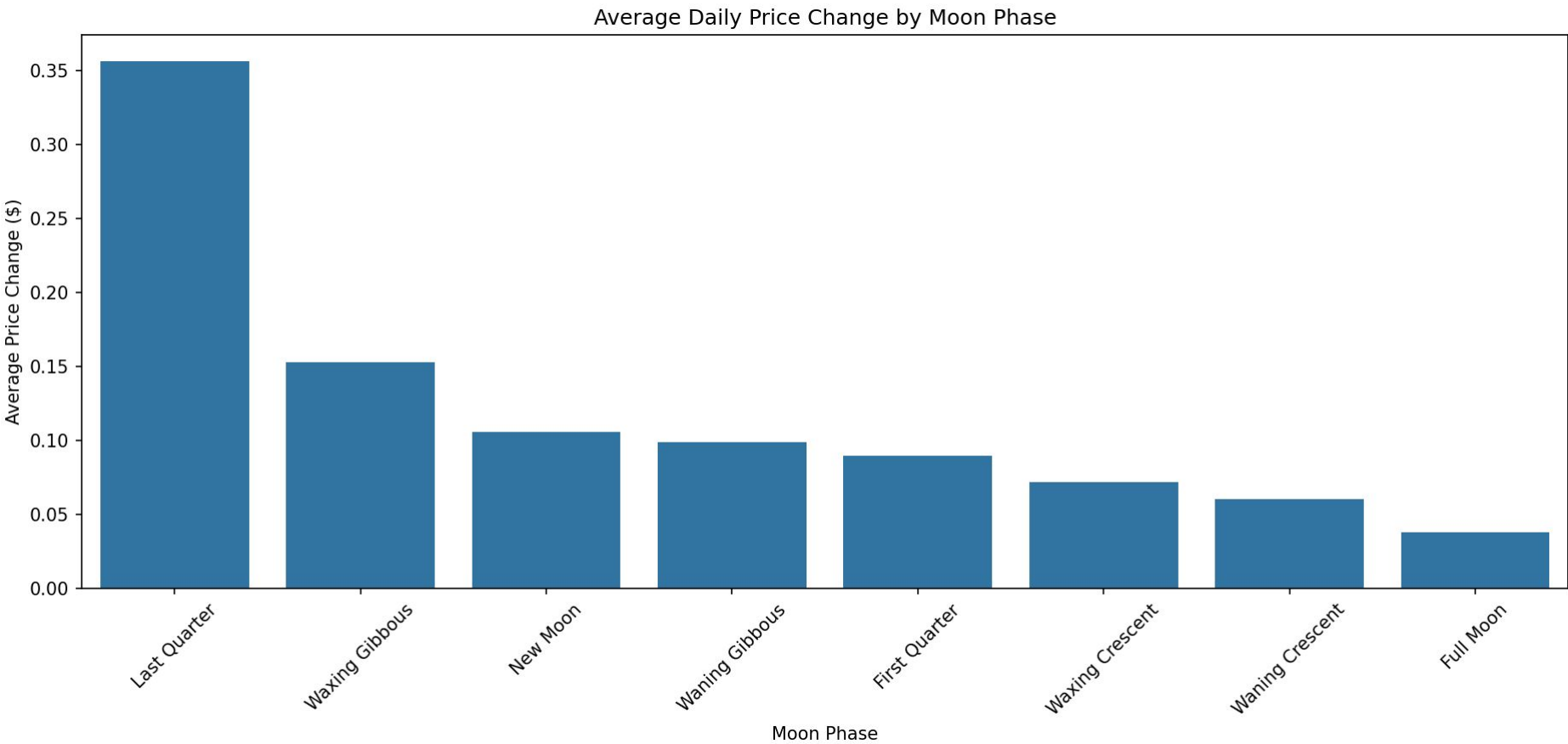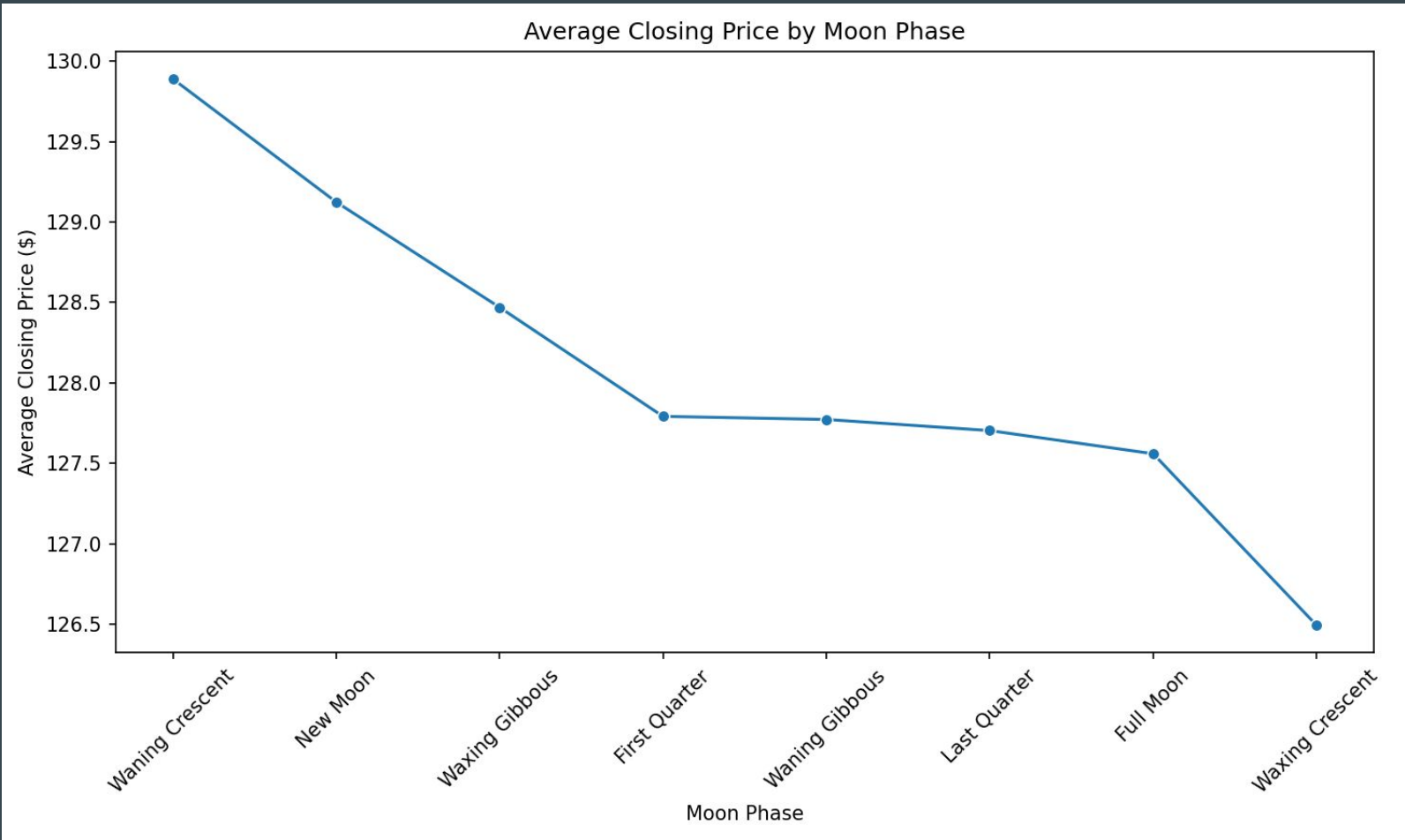# Findings (ML Analyses) 📋

Correlation: Tesla Stock Prices and Lunar Phases

ML Visual Analysis

Distribution of Moon Phases

ML Visual Analysis

Average Daily Price Change by Moon Phase

Average Closing Price by Moon Phase

Conclusion and Findings

Key Findings:

- Analyzed performance of five stocks (Apple, Nasdaq, Nvidia, Spy, Tesla) over four years:
  - $1000 investment at each new moon and selling at each full moon yielded positive returns for all stocks we investigated.
  - Stock prices generally increased over time.
  - Stock volumes remained relatively constant, indicating sustained interest.
- Utilized machine learning techniques:
  - Found a small but noticeable relationship between Tesla stock prices and lunar phases.
  - Suggests potential predictive value.

Summary:

- Investigation into lunar phases and stock behavior:
  - Yielded intriguing findings.
  - Indicates potential relationship worth further exploration.
  - Additional research and data refinement needed for validation and understanding.