Milestone 1

STOCK PRICE PREDICTION

Team 10

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Research Question

1. Can historical stock price data be used to predict the future stock prices of FAANG companies?
2. Could the unemployment rate and the nation's GDP impact the overall stock market performance of FAANG companies?

State of the Art

Stock prices and GDP in the long run (Alexius & Spång, 2018)

- The long-run equilibrium relationship between stock prices and GDP in the G7 countries
- Finding: Both domestic and foreign GDP have a significant impact on stock prices

The Impact of Inflation, GDP, Unemployment, and Money Supply On Stock Prices (Shiblee, 2009)

- Aims to show the different sensitivity of stocks by analysing data from 1994 -2007
- Strongest factor: Money supply
- Weak factors: Inflation and unemployment

State of the Art

The Stock Market/Unemployment Relationship in USA, China and Japan (Farsio & Fazel, 2013)

- Unemployment rates do not have a causal relationship with stock prices

Machine learning techniques and data for stock market forecasting: A literature review (Kumbure et al., 2022)

- A general review on the data and machine learning methods used in stock market prediction
- Combining different machine learning methods has proven effective in improving prediction accuracy

Datasets

Stock Price Dataset

- This dataset encompasses historical stock price data for FAANG companies.
- It featuring essential columns such as date, opening price, highest price, lowest price, closing price, adjusted closing price, and trading volume.
- It consists of 8,805 rows and 7 columns.
- Units of metrics is Dollars

Datasets

GDP Dataset

- This dataset consists of monthly economic data from year 1992 to 2023 of the United States.
- Two key variables: the Monthly Nominal GDP Index and the Monthly Real GDP Index.
- It consists of 378 rows and 3 columns
- Units of metrics is Dollars

Datasets

Unemployment Rate Dataset

- This dataset contains monthly adjusted unemployment rate from 1948 to 2023 in the United States.
- It featuring key columns such as observation date and Unemployment rate.
- It consists of 908 rows and 2 columns.
- Units of metrics is percentage.

Data Cleaning

Data Merging and Differentiation:

- Merged .csv files of “Amazon”, “Google”, “Netflix”, “Facebook” and “Apple” into single dataset
- Source column to differentiate between the datasets.

Packages for Cleaning Data:

- dpylr
- lubridate

Data Integrity:

- Checked for Null Values

Other Software Engineering Efforts

R studio

Excel

Python

Other Software Engineering Efforts

unemployment.csv — Open with Numbers

DATE	UNRATE
1948-01-01	3.4
1948-02-01	3.8
1948-03-01	4.0
1948-04-01	3.9
1948-05-01	3.5
1948-06-01	3.6
1948-07-01	3.6
1948-08-01	3.9
1948-09-01	3.8
1948-10-01	3.7
1948-11-01	3.8
1948-12-01	4.0
1949-01-01	4.3
1949-02-01	4.7
1949-03-01	5.0
1949-04-01	5.3
1949-05-01	6.1
1949-06-01	6.2
1949-07-01	6.7
1949-08-01	6.8
1949-09-01	6.6
1949-10-01	7.9
1949-11-01	6.4
1949-12-01	6.6
1950-01-01	6.5
1950-02-01	6.4
1950-03-01	6.3
1950-04-01	5.8
1950-05-01	5.5
1950-06-01	5.4

US-Monthly-GDP-History-Data — Open with Numbers

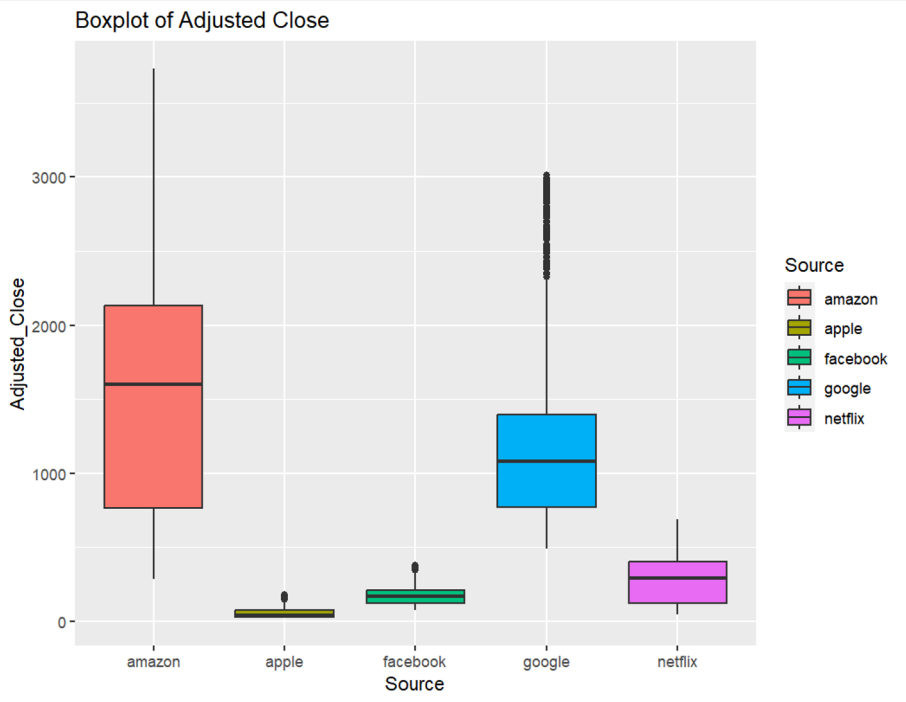
DATE	Monthly Nominal GDP Index	Monthly Real GDP Index
1992 - Jan	6315.523	9485.624
1992 - Feb	6356.725	9527.945
1992 - Mar	6417.058	9606.175
1992 - Apr	6443.170	9612.231
1992 - May	6433.786	9594.319
1992 - Jun	6535.333	9723.467
1992 - Jul	6557.165	9739.856
1992 - Aug	6556.862	9721.074
1992 - Sep	6585.895	9754.991
1992 - Oct	6637.500	9809.804
1992 - Nov	6680.168	9837.279
1992 - Dec	6724.741	9873.415
1993 - Jan	6717.909	9858.641
1993 - Feb	6741.541	9874.072
1993 - Mar	6728.927	9837.055
1993 - Apr	6768.199	9875.846
1993 - May	6824.219	9934.464
1993 - Jun	6834.399	9931.549
1993 - Jul	6832.718	9909.410
1993 - Aug	6874.015	9948.976
1993 - Sep	6939.562	10025.385
1993 - Oct	6944.388	10022.280
1993 - Nov	7035.958	10120.667
1993 - Dec	7060.868	10147.312
1994 - Jan	7074.339	10145.733
1994 - Feb	7122.980	10202.327
1994 - Mar	7149.636	10236.121
1994 - Apr	7186.416	10270.635
1994 - May	7290.263	10369.425
1994 - Jun	7264.115	10358.530

Pandas →

GDP_Unrate_merged_file_2023-09-24_21... — Open with Numbers

Standardized_Date	Monthly Nominal GDP Index	Monthly Real GDP Index	UNRATE
1992-01	6315.523	9485.624	7.3
1992-02	6356.725	9527.945	7.4
1992-03	6417.058	9606.175	7.4
1992-04	6443.17	9612.231	7.4
1992-05	6433.786	9594.319	7.6
1992-06	6535.333	9723.467	7.8
1992-07	6557.165	9739.856	7.7
1992-08	6556.862	9721.074	7.6
1992-09	6585.895	9754.991	7.6
1992-10	6637.5	9809.804	7.3
1992-11	6680.168	9837.279	7.4
1992-12	6724.741	9873.415	7.4
1993-01	6717.909	9858.641	7.3
1993-02	6741.541	9874.072	7.1
1993-03	6728.927	9837.055	7.0
1993-04	6768.199	9875.846	7.1
1993-05	6824.219	9934.464	7.1
1993-06	6834.399	9931.549	7.0
1993-07	6832.718	9909.41	6.9
1993-08	6874.015	9948.976	6.8
1993-09	6939.562	10025.385	6.7
1993-10	6944.388	10022.28	6.8
1993-11	7035.958	10120.667	6.6
1993-12	7060.868	10147.312	6.5
1994-01	7074.339	10145.733	6.6
1994-02	7122.98	10202.327	6.6
1994-03	7149.636	10236.121	6.5
1994-04	7186.416	10270.635	6.4
1994-05	7290.263	10369.425	6.1
1994-06	7264.115	10358.53	6.1

Code and visuals



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Thank you!!