Cloud Computing and Big Data Analytics

Homework 2: Real Prediction — Stock Price

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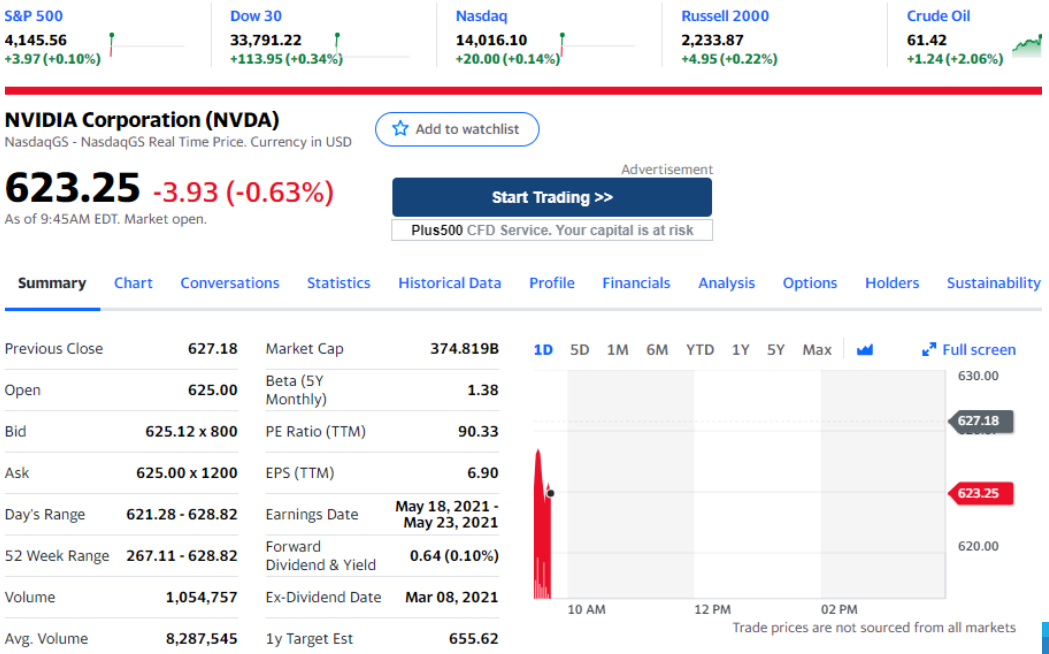
Problem Description

In this homework, you need to predict the stock price's Adjust Closing Price (CP) about 20 companies for 5 days. What is adjust closing price?

You are assigned to predict the the stock price's closing price "rise" / "remain stable" / "fall" comparing to the last day.



S&P 500	Dow 30	Nasdaq	Russell 2000	Crude Oil
4,145.56	33,791.22	14,016.10	2,233.87	61.42
+3.97 (+0.10%)	+113.95 (+0.34%)	+20.00 (+0.14%)	+4.95 (+0.22%)	+1.24 (+2.06%)

NVIDIA Corporation (NVDA)
NasdaqGS - NasdaqGS Real Time Price. Currency in USD

Add to watchlist

623.25 -3.93 (-0.63%)
As of 9:45AM EDT. Market open.

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Summary | Chart | Conversations | Statistics | Historical Data | Profile | Financials | Analysis | Options | Holders | Sustainability

Previous Close	627.18	Market Cap	374.819B
Open	625.00	Beta (5Y Monthly)	1.38
Bid	625.12 x 800	PE Ratio (TTM)	90.33
Ask	625.00 x 1200	EPS (TTM)	6.90
Day's Range	621.28 - 628.82	Earnings Date	May 18, 2021 - May 23, 2021
52 Week Range	267.11 - 628.82	Forward Dividend & Yield	0.64 (0.10%)
Volume	1,054,757	Ex-Dividend Date	Mar 08, 2021
Avg. Volume	8,287,545	1y Target Est	655.62

1D 5D 1M 6M YTD 1Y 5Y Max | Full screen

Trade prices are not sourced from all markets

Figure. Stock Price Information from Yahoo Finance.

Company List

1. US-INTC: Intel
2. US-AMD: AMD
3. US-CSCO: Cisco
4. US-AAPL: Apple
5. US-MU: Micron
6. US-NVDA: NVIDIA
7. US-QCOM: Qualcomm
8. US-AMZN: Amazon
9. US-NFLX: Netflix Inc
10. US-FB: Facebook Inc
11. US-GOOG: Alphabet Inc.(Google)
12. US-BABA: Alibaba Group
13. US-EBAY: eBAY Inc
14. US-IBM: IBM
15. US-XLNX: Xilinx
16. US-TXN: Texas Instruments
17. US-NOK: Nokia Corporation
18. US-TSLA: Tesla, Inc.
19. US-MSFT: Microsoft Corporation
20. US-SNPS: Synopsys, Inc.

Grading Policy

In this homework, there are stock prices of 20 companies you need to predict for 5 days (5/3, 5/4, 5/5, 5/6, 5/7).

Total: 100 pts, each prediction is 1 pts.

Day	Total Score
1	20
2	20
3	20
4	20
5	20

Stock Market Reference: https://finance.yahoo.com/

Prediction Metrics

Rate of Change: $R_{change} = \frac{|\mathrm{CP}_{today} - \mathrm{CP}_{yesterday}|}{\mathrm{CP}_{yesterday}}$

Definition:

- Rise: $\mathrm{CP}_{today} > \mathrm{CP}_{yesterday}$, $R_{change} > 1.5\ \%$
- Remain Stable: $R_{change} \leq 1.5\ \%$
- Fall: $\mathrm{CP}_{today} < \mathrm{CP}_{yesterday}$, $R_{change} > 1.5\ \%$

Submission File

Annotation:

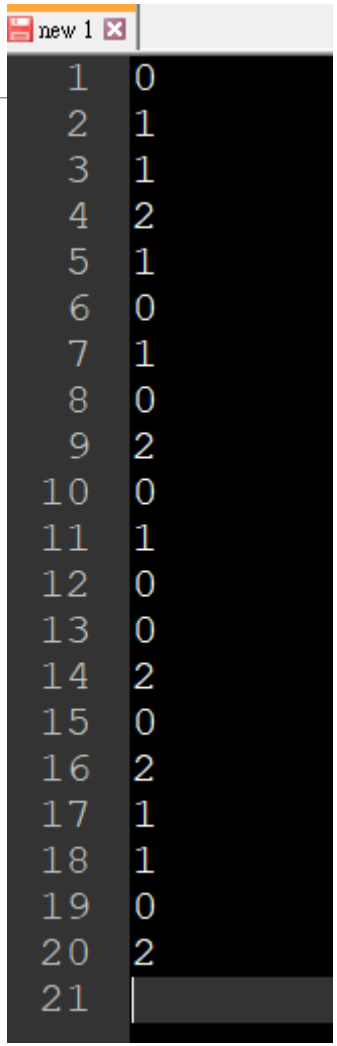
- Rise: 0 Remain Stable: 1 Fall: 2

Output File: [date]_[student_ID].txt

- Example: 0503_0700001.txt
- Format: each line contain one company's prediction.
- One correct one pts.
- Upload to E3 every day

Report: 1-page report to E3 (before 5/09)

Source Code: E3



Notification

- Since U.S. stock market open at 9:30 p.m.(GMT+8), you need to submit your prediction to newE3 every day before 8:00 p.m. (GMT+8).
- After 5-day predictions, please upload your source code and 1-page report to new E3.
- Do not predict by yourself, please use machine learning or other statistic techniques to do this homework.

(Show your Jupyter Notebook result or upload source code and input data, and TA will use yours with 5/07 data to validate your model)

- Remember to write down your reference in the document.

Do NOT Plagiarism !

Submission Deadline

Submission Time:

- Prediction Result: 8:00 p.m. on 5/3, 5/4, 5/5, 5/6, 5/7
- Report & Source code: 11:59 p.m. on 5/09

Submission File:

- New E3
  - Prediction (5 days) (before 8:00 p.m. on each day)
    - File name: [date]_[student_ID].txt
  - 1-Page Report(< 1 $page$ A4)
    - Algorithm, implementation and model description
    - Your reference (paper, website, GitHub…)
    - Your suggestion for this homework (optional)
    - Source code readme (ex. How to execute code?)
  - Jupyter Notebook / Source Code & input data (5/07)

New E3 Submission

Prediction Results:

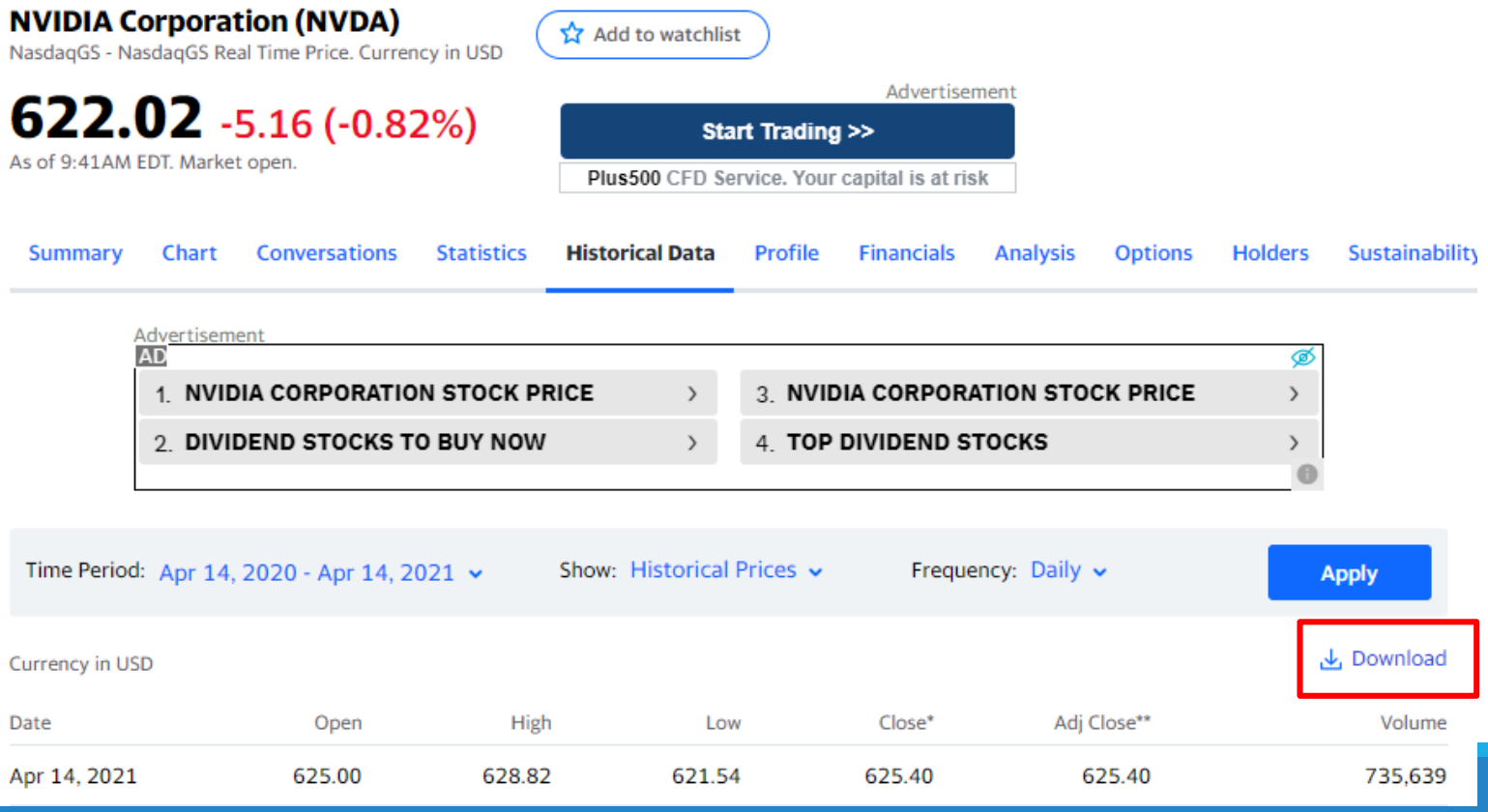
1. HW2: Real Prediction (5/03) — before 5/03 8:00 p.m.
2. HW2: Real Prediction (5/04) — before 5/04 8:00 p.m.
3. HW2: Real Prediction (5/05) — before 5/05 8:00 p.m.
4. HW2: Real Prediction (5/06) — before 5/06 8:00 p.m.
5. HW2: Real Prediction (5/07) — before 5/07 8:00 p.m.

Document and Source Code:

1. HW2: Real Prediction — Stock Price — before 5/09 11:59 p.m.

Appendix

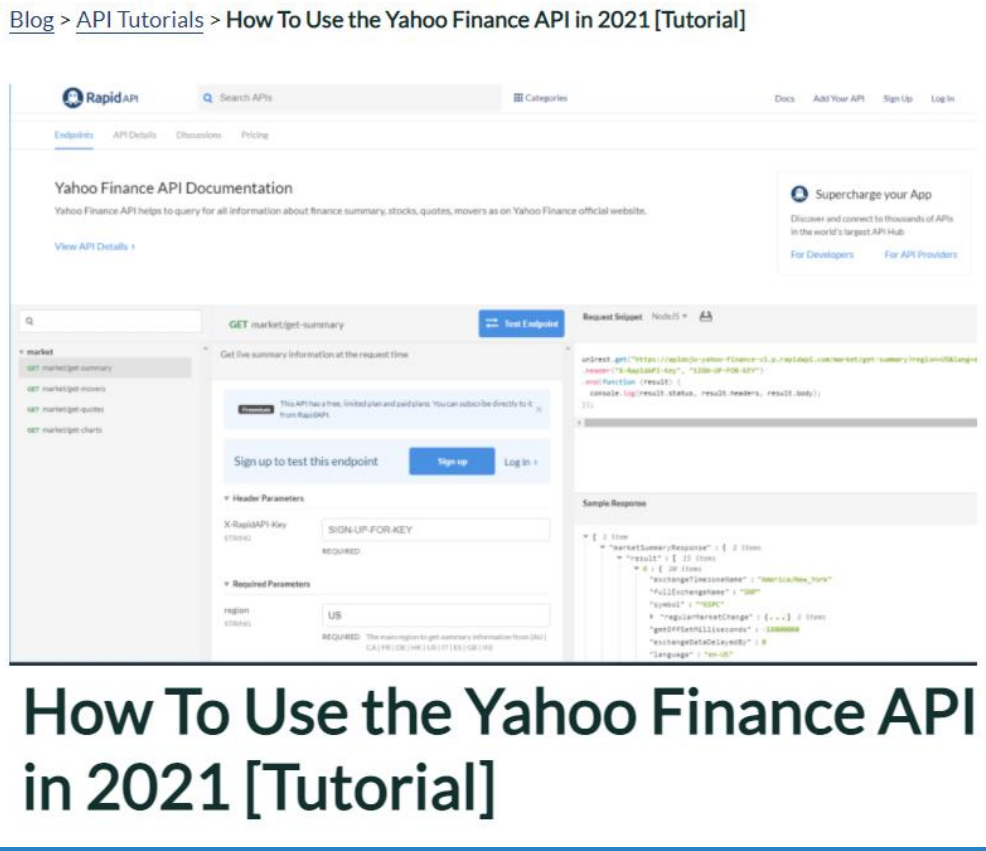
Example: Getting historical data from yahoo finance:
NVDA 622.45 -4.73 -0.75% : NVIDIA Corporation - Yahoo Finance



Appendix

Yahoo Finance API:

https://blog.rapidapi.com/how-to-use-the-yahoo-finance-api/



Appendix

ALPHA VANTAGE : Free Stock APIs in JSON & Excel | Alpha Vantage