Final_Assignment Library

March 5, 2023

Extracting Stock Data Using a Python Library

A company's stock share is a piece of the company more precisely:

A stock (also known as equity) is a security that represents the ownership of a fraction of a corporation. This entitles the owner of the stock to a proportion of the corporation's assets and profits equal to how much stock they own. Units of stock are called "shares." [1]

An investor can buy a stock and sell it later. If the stock price increases, the investor profits, If it decreases,the investor with incur a loss. Determining the stock price is complex; it depends on the number of outstanding shares, the size of the company's future profits, and much more. People trade stocks throughout the day the stock ticker is a report of the price of a certain stock, updated continuously throughout the trading session by the various stock market exchanges.

You are a data scientist working for a hedge fund; it's your job to determine any suspicious stock activity. In this lab you will extract stock data using a Python library. We will use the yfinance library, it allows us to extract data for stocks returning data in a pandas dataframe. You will use the lab to extract.

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Estimated Time Needed: 30 min

[2]:
```
!pip install yfinance==0.2.4
#!pip install pandas==1.3.3
```

```
Collecting yfinance==0.2.4
  Downloading yfinance-0.2.4-py2.py3-none-any.whl (51 kB)
                             51.4/51.4 kB
6.5 MB/s eta 0:00:00
Requirement already satisfied: cryptography>=3.3.2 in
/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from
yfinance==0.2.4) (38.0.2)
Requirement already satisfied: pytz>=2022.5 in
/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from
```

```
yfinance==0.2.4) (2022.6)
Collecting appdirs>=1.4.4
  Downloading appdirs-1.4.4-py2.py3-none-any.whl (9.6 kB)
Collecting html5lib>=1.1
  Downloading html5lib-1.1-py2.py3-none-any.whl (112 kB)
                           112.2/112.2
kB 9.6 MB/s eta 0:00:00
Collecting frozendict>=2.3.4
  Downloading
frozendict-2.3.5-cp37-cp37m-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (99
kB)
                           99.8/99.8 kB
12.8 MB/s eta 0:00:00
Collecting multitasking>=0.0.7
  Downloading multitasking-0.0.11-py3-none-any.whl (8.5 kB)
Requirement already satisfied: lxml>=4.9.1 in
/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from
yfinance==0.2.4) (4.9.1)
Requirement already satisfied: numpy>=1.16.5 in
/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from
yfinance==0.2.4) (1.21.6)
Requirement already satisfied: pandas>=1.3.0 in
/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from
yfinance==0.2.4) (1.3.5)
Requirement already satisfied: requests>=2.26 in
/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from
yfinance==0.2.4) (2.28.1)
Requirement already satisfied: beautifulsoup4>=4.11.1 in
/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from
yfinance==0.2.4) (4.11.1)
Requirement already satisfied: soupsieve>1.2 in
/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from
beautifulsoup4>=4.11.1->yfinance==0.2.4) (2.3.2.post1)
Requirement already satisfied: cffi>=1.12 in
/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from
cryptography>=3.3.2->yfinance==0.2.4) (1.15.1)
Requirement already satisfied: webencodings in
/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from
html5lib>=1.1->yfinance==0.2.4) (0.5.1)
Requirement already satisfied: six>=1.9 in
/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from
html5lib>=1.1->yfinance==0.2.4) (1.16.0)
Requirement already satisfied: python-dateutil>=2.7.3 in
/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from
pandas>=1.3.0->yfinance==0.2.4) (2.8.2)
Requirement already satisfied: charset-normalizer<3,>=2 in
/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from
```

```
requests>=2.26->yfinance==0.2.4) (2.1.1)
Requirement already satisfied: certifi>=2017.4.17 in
/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from
requests>=2.26->yfinance==0.2.4) (2022.9.24)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in
/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from
requests>=2.26->yfinance==0.2.4) (1.26.13)
Requirement already satisfied: idna<4,>=2.5 in
/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from
requests>=2.26->yfinance==0.2.4) (3.4)
Requirement already satisfied: pycparser in
/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from
cffi>=1.12->cryptography>=3.3.2->yfinance==0.2.4) (2.21)
Installing collected packages: multitasking, appdirs, html5lib, frozendict,
yfinance
Successfully installed appdirs-1.4.4 frozendict-2.3.5 html5lib-1.1
multitasking-0.0.11 yfinance-0.2.4
```

[3]:
```
import yfinance as yf
import pandas as pd
```

0.1 Using the yfinance Library to Extract Stock Data

Using the `Ticker` module we can create an object that will allow us to access functions to extract data. To do this we need to provide the ticker symbol for the stock, here the company is Apple and the ticker symbol is `AAPL`.

[4]:
```
apple = yf.Ticker("AAPL")
```

Now we can access functions and variables to extract the type of data we need. You can view them and what they represent here https://aroussi.com/post/python-yahoo-finance.

[5]:
```
!wget https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/
↪IBMDeveloperSkillsNetwork-PY0220EN-SkillsNetwork/data/apple.json
```

```
--2023-03-05 13:40:41--  https://cf-courses-data.s3.us.cloud-object-
storage.appdomain.cloud/IBMDeveloperSkillsNetwork-PY0220EN-
SkillsNetwork/data/apple.json
Resolving cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud (cf-
courses-data.s3.us.cloud-object-storage.appdomain.cloud)… 169.63.118.104
Connecting to cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud (cf-
courses-data.s3.us.cloud-object-storage.appdomain.cloud)|169.63.118.104|:443…
connected.
HTTP request sent, awaiting response… 200 OK
Length: 5699 (5.6K) [application/json]
Saving to: ‘apple.json’

apple.json          100%[===================>]   5.57K  --.-KB/s    in 0s
```

```
2023-03-05 13:40:41 (44.0 MB/s) - ‘apple.json’ saved [5699/5699]
```

0.1.1 Stock Info

Using the attribute info we can extract information about the stock as a Python dictionary.

[6]:
```
import json
with open('apple.json') as json_file:
    apple_info = json.load(json_file)
    # Print the type of data variable
    #print("Type:", type(apple_info))
apple_info
```

[6]:
```
{'zip': '95014',
 'sector': 'Technology',
 'fullTimeEmployees': 100000,
 'longBusinessSummary': 'Apple Inc. designs, manufactures, and markets
smartphones, personal computers, tablets, wearables, and accessories worldwide.
It also sells various related services. In addition, the company offers iPhone,
a line of smartphones; Mac, a line of personal computers; iPad, a line of multi-
purpose tablets; AirPods Max, an over-ear wireless headphone; and wearables,
home, and accessories comprising AirPods, Apple TV, Apple Watch, Beats products,
HomePod, and iPod touch. Further, it provides AppleCare support services; cloud
services store services; and operates various platforms, including the App Store
that allow customers to discover and download applications and digital content,
such as books, music, video, games, and podcasts. Additionally, the company
offers various services, such as Apple Arcade, a game subscription service;
Apple Music, which offers users a curated listening experience with on-demand
radio stations; Apple News+, a subscription news and magazine service; Apple
TV+, which offers exclusive original content; Apple Card, a co-branded credit
card; and Apple Pay, a cashless payment service, as well as licenses its
intellectual property. The company serves consumers, and small and mid-sized
businesses; and the education, enterprise, and government markets. It
distributes third-party applications for its products through the App Store. The
company also sells its products through its retail and online stores, and direct
sales force; and third-party cellular network carriers, wholesalers, retailers,
and resellers. Apple Inc. was incorporated in 1977 and is headquartered in
Cupertino, California.',
 'city': 'Cupertino',
 'phone': '408 996 1010',
 'state': 'CA',
 'country': 'United States',
 'companyOfficers': [],
 'website': 'https://www.apple.com',
 'maxAge': 1,
 'address1': 'One Apple Park Way',
```

```
'industry': 'Consumer Electronics',
'ebitdaMargins': 0.33890998,
'profitMargins': 0.26579002,
'grossMargins': 0.43019,
'operatingCashflow': 112241000448,
'revenueGrowth': 0.112,
'operatingMargins': 0.309,
'ebitda': 128217997312,
'targetLowPrice': 160,
'recommendationKey': 'buy',
'grossProfits': 152836000000,
'freeCashflow': 80153247744,
'targetMedianPrice': 199.5,
'currentPrice': 177.77,
'earningsGrowth': 0.25,
'currentRatio': 1.038,
'returnOnAssets': 0.19875,
'numberOfAnalystOpinions': 44,
'targetMeanPrice': 193.53,
'debtToEquity': 170.714,
'returnOnEquity': 1.45567,
'targetHighPrice': 215,
'totalCash': 63913000960,
'totalDebt': 122797998080,
'totalRevenue': 378323009536,
'totalCashPerShare': 3.916,
'financialCurrency': 'USD',
'revenuePerShare': 22.838,
'quickRatio': 0.875,
'recommendationMean': 1.8,
'exchange': 'NMS',
'shortName': 'Apple Inc.',
'longName': 'Apple Inc.',
'exchangeTimezoneName': 'America/New_York',
'exchangeTimezoneShortName': 'EDT',
'isEsgPopulated': False,
'gmtOffSetMilliseconds': '-14400000',
'quoteType': 'EQUITY',
'symbol': 'AAPL',
'messageBoardId': 'finmb_24937',
'market': 'us_market',
'annualHoldingsTurnover': None,
'enterpriseToRevenue': 7.824,
'beta3Year': None,
'enterpriseToEbitda': 23.086,
'52WeekChange': 0.4549594,
'morningStarRiskRating': None,
```

```
'forwardEps': 6.56,
'revenueQuarterlyGrowth': None,
'sharesOutstanding': 16319399936,
'fundInceptionDate': None,
'annualReportExpenseRatio': None,
'totalAssets': None,
'bookValue': 4.402,
'sharesShort': 111286790,
'sharesPercentSharesOut': 0.0068,
'fundFamily': None,
'lastFiscalYearEnd': 1632528000,
'heldPercentInstitutions': 0.59397,
'netIncomeToCommon': 100554997760,
'trailingEps': 6.015,
'lastDividendValue': 0.22,
'SandP52WeekChange': 0.15217662,
'priceToBook': 40.38392,
'heldPercentInsiders': 0.0007,
'nextFiscalYearEnd': 1695600000,
'yield': None,
'mostRecentQuarter': 1640390400,
'shortRatio': 1.21,
'sharesShortPreviousMonthDate': 1644883200,
'floatShares': 16302795170,
'beta': 1.185531,
'enterpriseValue': 2959991898112,
'priceHint': 2,
'threeYearAverageReturn': None,
'lastSplitDate': 1598832000,
'lastSplitFactor': '4:1',
'legalType': None,
'lastDividendDate': 1643932800,
'morningStarOverallRating': None,
'earningsQuarterlyGrowth': 0.204,
'priceToSalesTrailing12Months': 7.668314,
'dateShortInterest': 1647302400,
'pegRatio': 1.94,
'ytdReturn': None,
'forwardPE': 27.099087,
'lastCapGain': None,
'shortPercentOfFloat': 0.0068,
'sharesShortPriorMonth': 108944701,
'impliedSharesOutstanding': 0,
'category': None,
'fiveYearAverageReturn': None,
'previousClose': 178.96,
'regularMarketOpen': 178.55,
```

```
'twoHundredDayAverage': 156.03505,
'trailingAnnualDividendYield': 0.004833482,
'payoutRatio': 0.1434,
'volume24Hr': None,
'regularMarketDayHigh': 179.61,
'navPrice': None,
'averageDailyVolume10Day': 93823630,
'regularMarketPreviousClose': 178.96,
'fiftyDayAverage': 166.498,
'trailingAnnualDividendRate': 0.865,
'open': 178.55,
'toCurrency': None,
'averageVolume10days': 93823630,
'expireDate': None,
'algorithm': None,
'dividendRate': 0.88,
'exDividendDate': 1643932800,
'circulatingSupply': None,
'startDate': None,
'regularMarketDayLow': 176.7,
'currency': 'USD',
'trailingPE': 29.55445,
'regularMarketVolume': 92633154,
'lastMarket': None,
'maxSupply': None,
'openInterest': None,
'marketCap': 2901099675648,
'volumeAllCurrencies': None,
'strikePrice': None,
'averageVolume': 95342043,
'dayLow': 176.7,
'ask': 178.53,
'askSize': 800,
'volume': 92633154,
'fiftyTwoWeekHigh': 182.94,
'fromCurrency': None,
'fiveYearAvgDividendYield': 1.13,
'fiftyTwoWeekLow': 122.25,
'bid': 178.4,
'tradeable': False,
'dividendYield': 0.005,
'bidSize': 3200,
'dayHigh': 179.61,
'regularMarketPrice': 177.77,
'preMarketPrice': 178.38,
'logo_url': 'https://logo.clearbit.com/apple.com'}
```

We can get the 'country' using the key country

[7]:
```
apple_info['country']
```

[7]:
```
'United States'
```

0.1.2 Extracting Share Price

A share is the single smallest part of a company's stock that you can buy, the prices of these shares fluctuate over time. Using the history() method we can get the share price of the stock over a certain period of time. Using the `period` parameter we can set how far back from the present to get data. The options for `period` are 1 day (1d), 5d, 1 month (1mo) , 3mo, 6mo, 1 year (1y), 2y, 5y, 10y, ytd, and max.

[8]:
```
apple_share_price_data = apple.history(period="max")
```

The format that the data is returned in is a Pandas DataFrame. With the `Date` as the index the share `Open`, `High`, `Low`, `Close`, `Volume`, and `Stock Splits` are given for each day.

[9]:
```
apple_share_price_data.head()
```

[9]:

Date	Open	High	Low	Close	Volume	Dividends	Stock Splits
1980-12-12 00:00:00-05:00	0.099722	0.100155	0.099722	0.099722	469033600	0.0	0.0
1980-12-15 00:00:00-05:00	0.094953	0.094953	0.094519	0.094519	175884800	0.0	0.0
1980-12-16 00:00:00-05:00	0.088015	0.088015	0.087582	0.087582	105728000	0.0	0.0
1980-12-17 00:00:00-05:00	0.089749	0.090183	0.089749	0.089749	86441600	0.0	0.0
1980-12-18 00:00:00-05:00	0.092351	0.092785	0.092351	0.092351	73449600	0.0	0.0

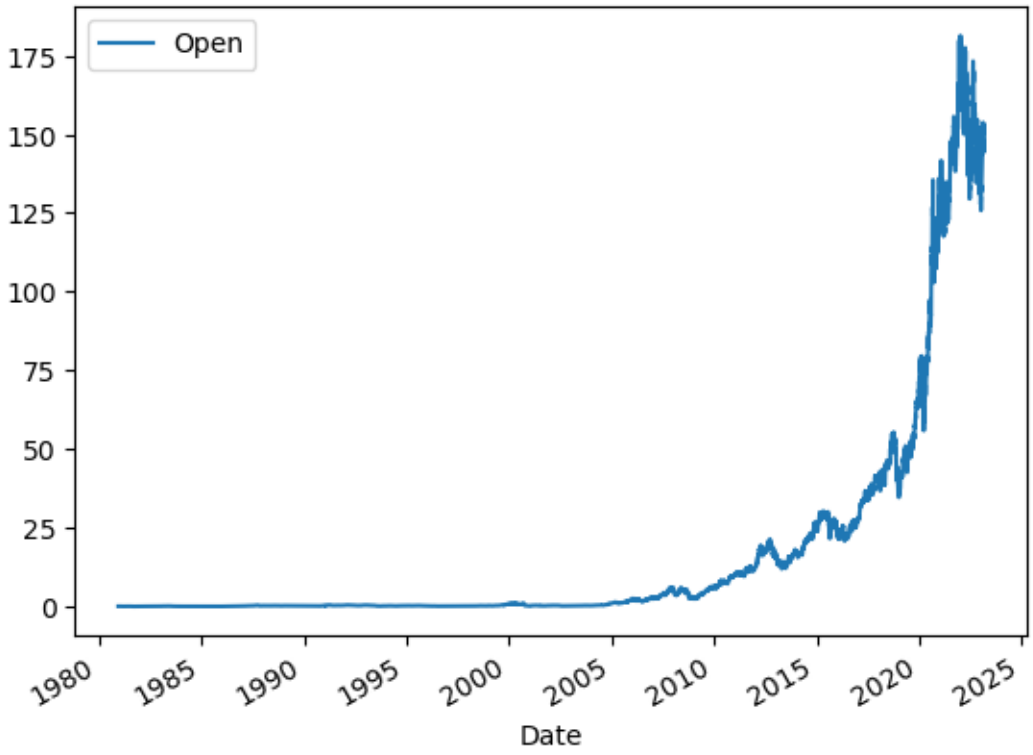
We can reset the index of the DataFrame with the `reset_index` function. We also set the `inplace` paramter to `True` so the change takes place to the DataFrame itself.

[10]:
```
apple_share_price_data.reset_index(inplace=True)
```

We can plot the `Open` price against the `Date`:

[11]:
```
apple_share_price_data.plot(x="Date", y="Open")
```

[11]:
```
<AxesSubplot:xlabel='Date'>
```



0.1.3 Extracting Dividends

Dividends are the distribution of a companys profits to shareholders. In this case they are defined as an amount of money returned per share an investor owns. Using the variable `dividends` we can get a dataframe of the data. The period of the data is given by the period defined in the 'history' function.

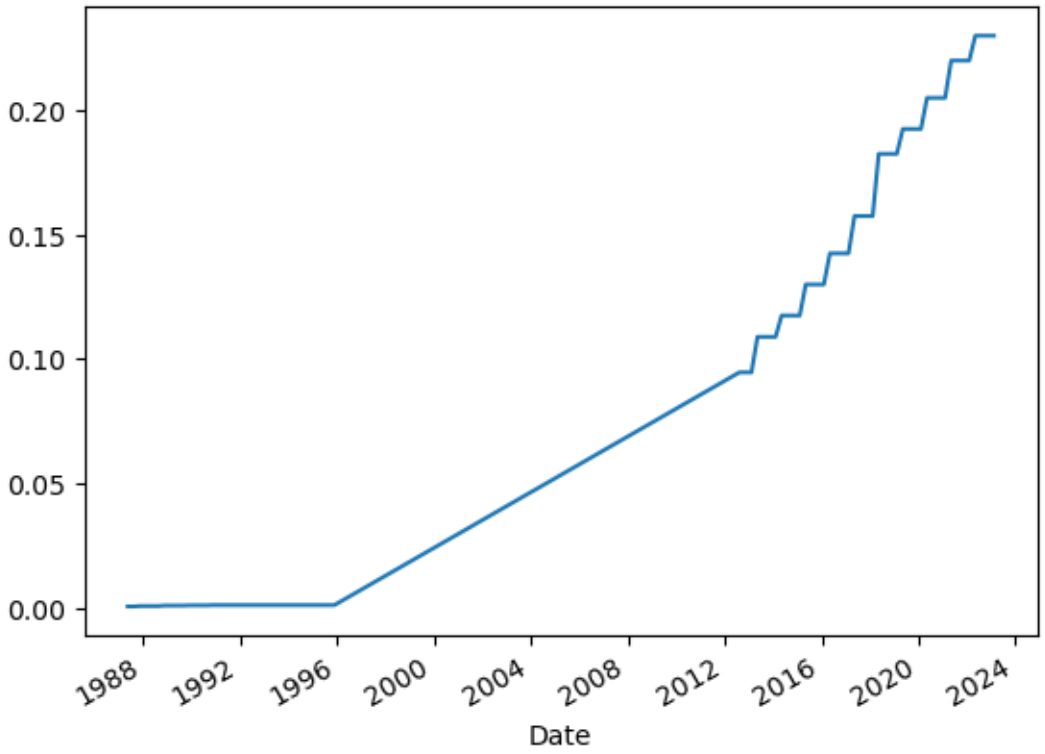
[12]:
```
apple.dividends
```

[12]:
```
Date
1987-05-11 00:00:00-04:00    0.000536
1987-08-10 00:00:00-04:00    0.000536
1987-11-17 00:00:00-05:00    0.000714
1988-02-12 00:00:00-05:00    0.000714
1988-05-16 00:00:00-04:00    0.000714
                               …
2022-02-04 00:00:00-05:00    0.220000
2022-05-06 00:00:00-04:00    0.230000
2022-08-05 00:00:00-04:00    0.230000
2022-11-04 00:00:00-04:00    0.230000
2023-02-10 00:00:00-05:00    0.230000
Name: Dividends, Length: 78, dtype: float64
```

We can plot the dividends overtime:

[13]:
```
apple.dividends.plot()
```

[13]:
```
<AxesSubplot:xlabel='Date'>
```



0.2 Exercise

Now using the `Ticker` module create an object for AMD (Advanced Micro Devices) with the ticker symbol is `AMD` called; name the object amd.

[14]:
```
amd = yf.Ticker("AMD")
```

[15]:
```
!wget https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/
↪IBMDeveloperSkillsNetwork-PY0220EN-SkillsNetwork/data/amd.json
```

```
--2023-03-05 13:43:12--  https://cf-courses-data.s3.us.cloud-object-
storage.appdomain.cloud/IBMDeveloperSkillsNetwork-PY0220EN-
SkillsNetwork/data/amd.json
Resolving cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud (cf-
courses-data.s3.us.cloud-object-storage.appdomain.cloud)… 169.63.118.104
Connecting to cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud (cf-
courses-data.s3.us.cloud-object-storage.appdomain.cloud)|169.63.118.104|:443…
```

```
connected.
HTTP request sent, awaiting response… 200 OK
Length: 5838 (5.7K) [application/json]
Saving to: ‘amd.json’

amd.json            100%[===================>]   5.70K  --.-KB/s    in 0s

2023-03-05 13:43:12 (32.1 MB/s) - ‘amd.json’ saved [5838/5838]
```

[17]:
```
import json
with open('amd.json') as json_file:
    amd_info = json.load(json_file)
    # Print the type of data variable
    #print("Type:", type(apple_info))
amd_info
```

[17]:
```
{'zip': '95054',
 'sector': 'Technology',
 'fullTimeEmployees': 15500,
 'longBusinessSummary': 'Advanced Micro Devices, Inc. operates as a
semiconductor company worldwide. The company operates in two segments, Computing
and Graphics; and Enterprise, Embedded and Semi-Custom. Its products include x86
microprocessors as an accelerated processing unit, chipsets, discrete and
integrated graphics processing units (GPUs), data center and professional GPUs,
and development services; and server and embedded processors, and semi-custom
System-on-Chip (SoC) products, development services, and technology for game
consoles. The company provides processors for desktop and notebook personal
computers under the AMD Ryzen, AMD Ryzen PRO, Ryzen Threadripper, Ryzen
Threadripper PRO, AMD Athlon, AMD Athlon PRO, AMD FX, AMD A-Series, and AMD PRO
A-Series processors brands; discrete GPUs for desktop and notebook PCs under the
AMD Radeon graphics, AMD Embedded Radeon graphics brands; and professional
graphics products under the AMD Radeon Pro and AMD FirePro graphics brands. It
also offers Radeon Instinct, Radeon PRO V-series, and AMD Instinct accelerators
for servers; chipsets under the AMD trademark; microprocessors for servers under
the AMD EPYC; embedded processor solutions under the AMD Athlon, AMD Geode, AMD
Ryzen, AMD EPYC, AMD R-Series, and G-Series processors brands; and customer-
specific solutions based on AMD CPU, GPU, and multi-media technologies, as well
as semi-custom SoC products. It serves original equipment manufacturers, public
cloud service providers, original design manufacturers, system integrators,
independent distributors, online retailers, and add-in-board manufacturers
through its direct sales force, independent distributors, and sales
representatives. The company was incorporated in 1969 and is headquartered in
Santa Clara, California.',
 'city': 'Santa Clara',
 'phone': '408 749 4000',
 'state': 'CA',
```

```
'country': 'United States',
'companyOfficers': [],
'website': 'https://www.amd.com',
'maxAge': 1,
'address1': '2485 Augustine Drive',
'industry': 'Semiconductors',
'ebitdaMargins': 0.24674,
'profitMargins': 0.19240999,
'grossMargins': 0.48248002,
'operatingCashflow': 3520999936,
'revenueGrowth': 0.488,
'operatingMargins': 0.22198,
'ebitda': 4055000064,
'targetLowPrice': 107,
'recommendationKey': 'buy',
'grossProfits': 7929000000,
'freeCashflow': 3122749952,
'targetMedianPrice': 150,
'currentPrice': 119.22,
'earningsGrowth': -0.454,
'currentRatio': 2.024,
'returnOnAssets': 0.21327,
'numberOfAnalystOpinions': 38,
'targetMeanPrice': 152.02,
'debtToEquity': 9.764,
'returnOnEquity': 0.47428,
'targetHighPrice': 200,
'totalCash': 3608000000,
'totalDebt': 732000000,
'totalRevenue': 16433999872,
'totalCashPerShare': 3.008,
'financialCurrency': 'USD',
'revenuePerShare': 13.548,
'quickRatio': 1.49,
'recommendationMean': 2.2,
'exchange': 'NMS',
'shortName': 'Advanced Micro Devices, Inc.',
'longName': 'Advanced Micro Devices, Inc.',
'exchangeTimezoneName': 'America/New_York',
'exchangeTimezoneShortName': 'EDT',
'isEsgPopulated': False,
'gmtOffSetMilliseconds': '-14400000',
'quoteType': 'EQUITY',
'symbol': 'AMD',
'messageBoardId': 'finmb_168864',
'market': 'us_market',
'annualHoldingsTurnover': None,
```

'enterpriseToRevenue': 8.525,
'beta3Year': None,
'enterpriseToEbitda': 34.551,
'52WeekChange': 0.51966953,
'morningStarRiskRating': None,
'forwardEps': 4.72,
'revenueQuarterlyGrowth': None,
'sharesOutstanding': 1627360000,
'fundInceptionDate': None,
'annualReportExpenseRatio': None,
'totalAssets': None,
'bookValue': 6.211,
'sharesShort': 27776129,
'sharesPercentSharesOut': 0.0171,
'fundFamily': None,
'lastFiscalYearEnd': 1640390400,
'heldPercentInstitutions': 0.52896,
'netIncomeToCommon': 3161999872,
'trailingEps': 2.57,
'lastDividendValue': 0.005,
'SandP52WeekChange': 0.15217662,
'priceToBook': 19.194977,
'heldPercentInsiders': 0.00328,
'nextFiscalYearEnd': 1703462400,
'yield': None,
'mostRecentQuarter': 1640390400,
'shortRatio': 0.24,
'sharesShortPreviousMonthDate': 1644883200,
'floatShares': 1193798619,
'beta': 1.848425,
'enterpriseValue': 140104957952,
'priceHint': 2,
'threeYearAverageReturn': None,
'lastSplitDate': 966902400,
'lastSplitFactor': '2:1',
'legalType': None,
'lastDividendDate': 798940800,
'morningStarOverallRating': None,
'earningsQuarterlyGrowth': -0.453,
'priceToSalesTrailing12Months': 11.805638,
'dateShortInterest': 1647302400,
'pegRatio': 0.99,
'ytdReturn': None,
'forwardPE': 25.258476,
'lastCapGain': None,
'shortPercentOfFloat': 0.0171,
'sharesShortPriorMonth': 88709340,

```
'impliedSharesOutstanding': 0,
'category': None,
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'previousClose': 123.23,
'regularMarketOpen': 123.04,
'twoHundredDayAverage': 116.6998,
'trailingAnnualDividendYield': 0,
'payoutRatio': 0,
'volume24Hr': None,
'regularMarketDayHigh': 125.66,
'navPrice': None,
'averageDailyVolume10Day': 102167370,
'regularMarketPreviousClose': 123.23,
'fiftyDayAverage': 115.95,
'trailingAnnualDividendRate': 0,
'open': 123.04,
'toCurrency': None,
'averageVolume10days': 102167370,
'expireDate': None,
'algorithm': None,
'dividendRate': None,
'exDividendDate': 798940800,
'circulatingSupply': None,
'startDate': None,
'regularMarketDayLow': 118.59,
'currency': 'USD',
'trailingPE': 46.389107,
'regularMarketVolume': 99476946,
'lastMarket': None,
'maxSupply': None,
'openInterest': None,
'marketCap': 194013855744,
'volumeAllCurrencies': None,
'strikePrice': None,
'averageVolume': 102428813,
'dayLow': 118.59,
'ask': 117.24,
'askSize': 1100,
'volume': 99476946,
'fiftyTwoWeekHigh': 164.46,
'fromCurrency': None,
'fiveYearAvgDividendYield': None,
'fiftyTwoWeekLow': 72.5,
'bid': 117.24,
'tradeable': False,
'dividendYield': None,
'bidSize': 900,
```

```
 'dayHigh': 125.66,
 'regularMarketPrice': 119.22,
 'preMarketPrice': 116.98,
 'logo_url': 'https://logo.clearbit.com/amd.com'}
```

Question 1 Use the key 'country' to find the country the stock belongs to, remember it as it will be a quiz question.

[18]:
```
amd_info['country']
```

[18]:
```
'United States'
```

Question 2 Use the key 'sector' to find the sector the stock belongs to, remember it as it will be a quiz question.

[19]:
```
amd_info['sector']
```

[19]:
```
'Technology'
```

Question 3 Obtain stock data for AMD using the `history` function, set the `period` to max. Find the `Volume` traded on the first day (first row).

[20]:
```
amd_share_price_data = amd.history(period="max")
```

[21]:
```
apple_share_price_data.head()
```

[21]:

	Date	Open	High	Low	Close	\
0	1980-12-12 00:00:00-05:00	0.099722	0.100155	0.099722	0.099722	
1	1980-12-15 00:00:00-05:00	0.094953	0.094953	0.094519	0.094519	
2	1980-12-16 00:00:00-05:00	0.088015	0.088015	0.087582	0.087582	
3	1980-12-17 00:00:00-05:00	0.089749	0.090183	0.089749	0.089749	
4	1980-12-18 00:00:00-05:00	0.092351	0.092785	0.092351	0.092351	

	Volume	Dividends	Stock Splits
0	469033600	0.0	0.0
1	175884800	0.0	0.0
2	105728000	0.0	0.0
3	86441600	0.0	0.0
4	73449600	0.0	0.0

About the Authors:

Joseph Santarcangelo has a PhD in Electrical Engineering, his research focused on using machine learning, signal processing, and computer vision to determine how videos impact human cognition. Joseph has been working for IBM since he completed his PhD.

Azim Hirjani

0.3 Change Log

Date (YYYY-MM-DD)	Version	Changed By	Change Description
2020-11-10	1.1	Malika Singla	Deleted the Optional part
2020-08-27	1.0	Malika Singla	Added lab to GitLab

##