**Helpful tools for implementing trading strategies/analyzing stock trends.**

**Step 1: Installing Anaconda on your device, Python version 3+**

<https://www.anaconda.com/products/individual>

Go on the link and scroll to the bottom where you will find installers for Windows, MacOS, Linux systems.

**Step 2: Open Jupyter notebooks to install some basic libraries like yfinance and ta-lib**

**Step 3 : Installing Yfinance**

**Library 1:** Yfinance (Yahoo Finance)

**Why it is useful:** Helps download data on stock price and other important information easily for chosen periods of time.

**How to install:** Insert the below text into a cell in a jupyter notebook and click run

conda install -c ranaroussi yfinance

**How to use:**

Now that you have it installed, start of by importing yfinance**->**

* Import yfinance as yf

To intitialize the stock you want to download data for, use the ticker function in yfinance like this->

* msft=yf.ticker(“MSFT”)

To download data from a certain time interval in days, use the history function->

* msfthistory=msft.history(start=”yyyy-mm-dd”, end=”yyyy-mm-dd”, interval=”xx”)
* msfthistory=mfst.history(period=”xxx”)

For the history function you can use either period or start and end dates to pull data.

* If you use period, then valid inputs include= “1d”, “5d”, “1mo”, “3mo”, “6mo”, “1y”, “2y”, “5y”, “10y”, “ytd”, “max”.
* D represents day, mo represents month, y represents year, ytd is year to date where you will get data from the beginning of the current year to current day. Max will download all the data that is available for that stock.
* If you use start and end dates then your dates should be in the format of year-month-day
* You can also use interval of data that you want. This interval ranges from “1m”, “2m”, “5m”, “15m”, “30m”, “60m”, “90m”, “1h”, “1d”, “5d”, “1wk”, “1mo”, “3mo”
* The m represents minutes, h represents hour and wk represents week.
* Restrictions to intervals:
  + You can only get minute to minute data for a time period of 7 days.
  + You can have an interval of lesser than one day for only a time period of 60 days or less.

You can also download data for multiple stocks at once using->

* T=yf.download(“APPL MSFT”, start=”yyyy-mm-dd”, end=yyyy-mm-dd”)

To view all the information you can get about the stock->

* Print(msft.info)

Or

* Print(msft.info.keys())

These will let you see the dictionary or different keys in the dictionary so you can pull helpful data calling print(msft.info[“xxx”]) if needed.

**Step 4: Install ta-lib library**

**Library 2:** ta-lib (Technical Analysis)

**Why is it useful:** can calculate values like MACD, RSI etc easily which are widely used for simple trading strategies.

**How to install**: insert the below line into a cell in a jupyter notebook and click run

conda install -c conda-forge ta-lib

**Import it:**

* Import talib

**How to use it:**

1. Download stock data using yfinance
2. Create a dataframe using downloaded data
   1. Ex: df=msft.history(start=, end=)

Once the dataframe is created, we can calculate different moving averages and store them by creating a new column.

Example 1: Simple moving average

* df['MA'] = ta.SMA(df['Close'],20)

Here close represents the closing price of stock at whatever time interval data is downloaded and 20 represents the time period of averages. So in this average of past 20 intervals is taken.

You can even plot it using->

* df[['Close','MA']].plot(figsize=(12,12))
* plt.show()

**Other indicators:**

* Exponential Moving Average using: ta.EMA
* Relative strength Index: ta.RSI
* MACD->
  + data["macd"], data["macd\_signal"], data["macd\_hist"] = talib.MACD(data['Close'])

Here MACD is the moving average convergence divergence. The MACD signal is the 9-day EMA and the MACD histogram which graphs the distance between MACD and its signal line.

To see an example of the libraries being installed look at installations.ipynb or run it on your laptop for easy installation.

**Implement Trading strategies/ Data Visualization:**

**Moving Average Convergence Divergence (MACD)**

* This average is one of the most commonly used trading strategies because it is easy to implement and works fairly well. The MACD is calculated by taking the difference of the 12-day exponential moving average and 26-day exponential moving average.
* Finally, a 9-day exponential moving average is taken from the MACD series and counted as the signal for the MACD series. Whenever MACD values are larger than the signal, you should buy the stock and whenever it dips below, you sell it.
* They way this is checked in python is by creating a signal of 1 whenever MACD is greater than its signal and -1 otherwise.
* MACD can be calculated using functions in pandas or the Technical analysis Library(ta-lib).
* An implementation of pandas can be found in the MACD strategy file and ta-lib in the technical analysis visualization file.