1_TimeSeries_GetData

September 13, 2021

[5]:
```
import yfinance as yf
import os
```

[6]:
```
symbols = ['MMM','ABT','ABBV','ACN','ATVI','AYI','ADBE','AMD','AAP','AES','AET',
           'AMG','AFL','A','APD','AKAM','ALK','ALB','ARE','ALXN','ALGN','ALLE',
           'AGN','ADS','LNT','ALL','GOOGL','GOOG','MO','AMZN','AEE','AAL','AEP',
          ␣
↪'AXP','AIG','AMT','AWK','AMP','ABC','AME','AMGN','APH','APC','ADI','ANDV',
          ␣
↪'ANSS','ANTM','AON','AOS','APA','AIV','AAPL','AMAT','APTV','ADM','ARNC',
          ␣
↪'AJG','AIZ','T','ADSK','ADP','AZO','AVB','AVY','BHGE','BLL','BAC','BK',
           'BAX','BBT','BDX','BRK.
↪B','BBY','BIIB','BLK','HRB','BA','BWA','BXP','BSX',
           'BHF','BMY','AVGO','BF.
↪B','CHRW','CA','COG','CDNS','CPB','COF','CAH','CBOE',
          ␣
↪'KMX','CCL','CAT','CBG','CBS','CELG','CNC','CNP','CTL','CERN','CF','SCHW',
          ␣
↪'CHTR','CHK','CVX','CMG','CB','CHD','CI','XEC','CINF','CTAS','CSCO','C','CFG',
          ␣
↪'CTXS','CLX','CME','CMS','KO','CTSH','CL','CMCSA','CMA','CAG','CXO','COP',
          ␣
↪'ED','STZ','COO','GLW','COST','COTY','CCI','CSRA','CSX','CMI','CVS','DHI',
          ␣
↪'DHR','DRI','DVA','DE','DAL','XRAY','DVN','DLR','DFS','DISCA','DISCK','DISH',
          ␣
↪'DG','DLTR','D','DOV','DWDP','DPS','DTE','DRE','DUK','DXC','ETFC','EMN','ETN',
          ␣
↪'EBAY','ECL','EIX','EW','EA','EMR','ETR','EVHC','EOG','EQT','EFX','EQIX','EQR',
          ␣
↪'ESS','EL','ES','RE','EXC','EXPE','EXPD','ESRX','EXR','XOM','FFIV','FB','FAST',
          ␣
↪'FRT','FDX','FIS','FITB','FE','FISV','FLIR','FLS','FLR','FMC','FL','F','FTV',
          ␣
↪'FBHS','BEN','FCX','GPS','GRMN','IT','GD','GE','GGP','GIS','GM','GPC','GILD',
```

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␣
↪'GPN','GS','GT','GWW','HAL','HBI','HOG','HRS','HIG','HAS','HCA','HCP','HP','HSIC',
␣
↪'HSY','HES','HPE','HLT','HOLX','HD','HON','HRL','HST','HPQ','HUM','HBAN','HII',
␣
↪'IDXX','INFO','ITW','ILMN','IR','INTC','ICE','IBM','INCY','IP','IPG','IFF','INTU',
␣
↪'ISRG','IVZ','IQV','IRM','JEC','JBHT','SJM','JNJ','JCI','JPM','JNPR','KSU','K','KEY',
␣
↪'KMB','KIM','KMI','KLAC','KSS','KHC','KR','LB','LLL','LH','LRCX','LEG','LEN','LUK',
␣
↪'LLY','LNC','LKQ','LMT','L','LOW','LYB','MTB','MAC','M','MRO','MPC','MAR','MMC','MLM',
␣
↪'MAS','MA','MAT','MKC','MCD','MCK','MDT','MRK','MET','MTD','MGM','KORS','MCHP','MU',
␣
↪'MSFT','MAA','MHK','TAP','MDLZ','MON','MNST','MCO','MS','MOS','MSI','MYL','NDAQ',
␣
↪'NOV','NAVI','NTAP','NFLX','NWL','NFX','NEM','NWSA','NWS','NEE','NLSN','NKE','NI',
␣
↪'NBL','JWN','NSC','NTRS','NOC','NCLH','NRG','NUE','NVDA','ORLY','OXY','OMC','OKE',
␣
↪'ORCL','PCAR','PKG','PH','PDCO','PAYX','PYPL','PNR','PBCT','PEP','PKI','PRGO','PFE',
␣
↪'PCG','PM','PSX','PNW','PXD','PNC','RL','PPG','PPL','PX','PCLN','PFG','PG','PGR',
␣
↪'PLD','PRU','PEG','PSA','PHM','PVH','QRVO','PWR','QCOM','DGX','RRC','RJF','RTN','O',
␣
↪'RHT','REG','REGN','RF','RSG','RMD','RHI','ROK','COL','ROP','ROST','RCL','CRM','SBAC',
␣
↪'SCG','SLB','SNI','STX','SEE','SRE','SHW','SIG','SPG','SWKS','SLG','SNA','SO','LUV',
␣
↪'SPGI','SWK','SBUX','STT','SRCL','SYK','STI','SYMC','SYF','SNPS','SYY','TROW','TPR',
␣
↪'TGT','TEL','FTI','TXN','TXT','TMO','TIF','TWX','TJX','TMK','TSS','TSCO','TDG','TRV',
␣
↪'TRIP','FOXA','FOX','TSN','UDR','ULTA','USB','UAA','UA','UNP','UAL','UNH','UPS','URI',
␣
↪'UTX','UHS','UNM','VFC','VLO','VAR','VTR','VRSN','VRSK','VZ','VRTX','VIAB','V','VNO',
␣
↪'VMC','WMT','WBA','DIS','WM','WAT','WEC','WFC','HCN','WDC','WU','WRK','WY','WHR','WMB',
␣
↪'WLTW','WYN','WYNN','XEL','XRX','XLNX','XL','XYL','YUM','ZBH','ZION','ZTS']
```

[7]:
```
symbols.append('SPY')
```

[8]:
```
if not os.path.exists('data'):
    os.mkdir('data')
```

[9]:
```
'''
Next, I create a folder called Data, which is where we will store our␣
 ↪downloaded data.
'''

'''
Next, we have a loop that looks at all the symbols and symbols list one by one.
'''
for symbol in symbols:
    '''
    Inside this loop, we check whether or not a CSFI file already exists for␣
 ↪our symbol in the data folder.
    '''
    if not os.path.exists(f"data/{symbol}.csv"):
        '''
        If it doesn't, then we proceed. Next, we call the function we have to␣
 ↪download to download stock data for the current symbol of used
        '''
        data = yf.download(symbol, start="2010-01-01", end="2018-12-31")
        '''
        So when we get back our data frame, we want to check it size.
        If the size is greater than zero, then we save the data frame in the␣
 ↪second loop.
        '''
        if data.size > 0:
            data.to_csv(f"data/{symbol}.csv")
        else:
            print("Not saving...")
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- BHGE: No data found, symbol may be delisted
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- BBT: No data found, symbol may be delisted
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- BRK.B: No data found, symbol may be delisted
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- BF.B: No data found for this date range, symbol may be delisted
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- CBS: No data found, symbol may be delisted
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- CELG: No data found, symbol may be delisted
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- CXO: No data found, symbol may be delisted
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1 Failed download:
- NBL: No data found, symbol may be delisted
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1 Failed download:
- PX: Data doesn't exist for startDate = 1262284200, endDate = 1546194600
Not saving…
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1 Failed download:
- PCLN: No data found for this date range, symbol may be delisted
Not saving…
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1 Failed download:
- RTN: No data found, symbol may be delisted
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1 Failed download:
- RHT: No data found, symbol may be delisted
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1 Failed download:
- STI: No data found, symbol may be delisted
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1 Failed download:
- SYMC: No data found, symbol may be delisted
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1 Failed download:
- TIF: No data found, symbol may be delisted
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1 Failed download:
- TMK: No data found, symbol may be delisted
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1 Failed download:
- TSS: No data found, symbol may be delisted
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1 Failed download:
- FOXA: Data doesn't exist for startDate = 1262284200, endDate = 1546194600
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1 Failed download:
- FOX: Data doesn't exist for startDate = 1262284200, endDate = 1546194600
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1 Failed download:
- UTX: No data found, symbol may be delisted
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1 Failed download:
- VAR: No data found, symbol may be delisted
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1 Failed download:
- VIAB: No data found, symbol may be delisted
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1 Failed download:
- HCN: No data found for this date range, symbol may be delisted
Not saving…
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1 Failed download:
- WYN: No data found for this date range, symbol may be delisted
Not saving…
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1 Failed download:
- XL: Data doesn't exist for startDate = 1262284200, endDate = 1546194600
Not saving…
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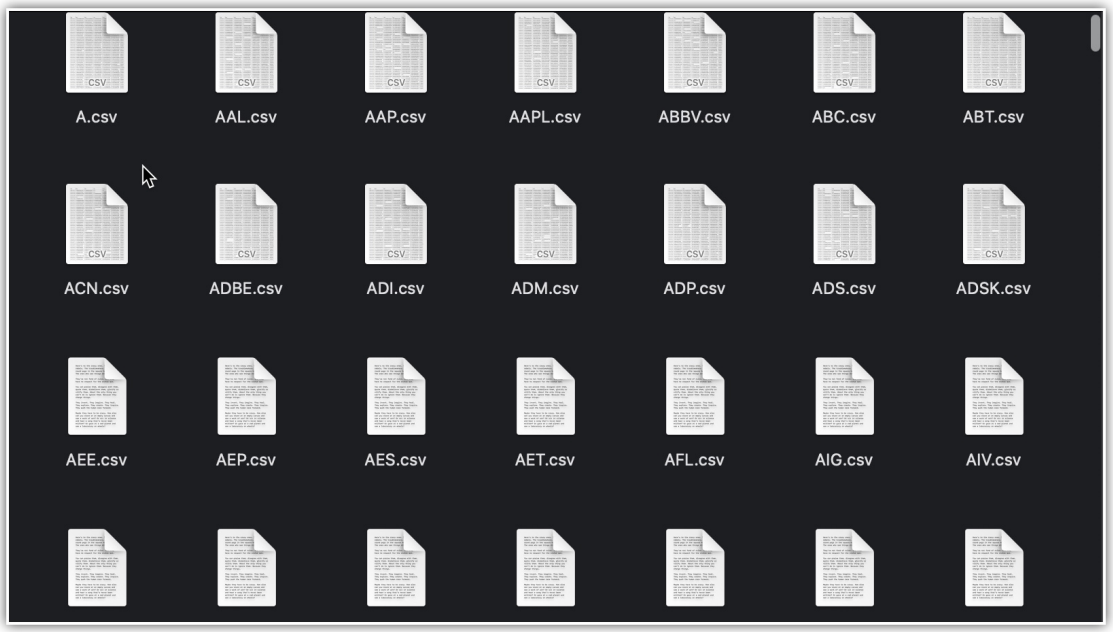
[12]:
```
'''
Delete files which have <10 lines
'''
```

```
for symbol in symbols:
    if  os.path.exists(f"data/{symbol}.csv"):
        s = open(f"data/{symbol}.csv").readlines()
        if len(s) < 10:
            os.system(f"rm data/{symbol}.csv")
```

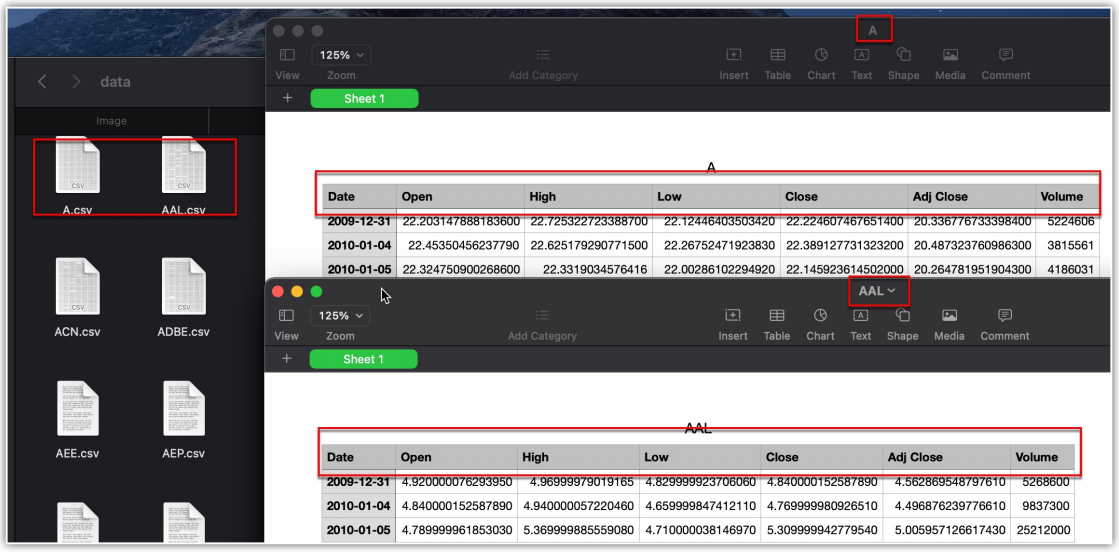
[13]:
```
#Downlod the below Files
from IPython.display import Image
Image(filename='/Users/subhasish/GIT/Interstellar/SB-AI-DEV/ML/SB/TimeSeries/
 ↪Lazy Programmers/Image/f1.jpg')
```

[13]:



[14]:
```
'''
You might wonder why did I previously save each data frame in a separate CSV␣
 ↪rather than just combining
them all into the same CSV?
Well, the reason is, as you'll see later, they all have the exact same column␣
 ↪names and dates.
'''
from IPython.display import Image
Image(filename='/Users/subhasish/GIT/Interstellar/SB-AI-DEV/ML/SB/TimeSeries/
 ↪Lazy Programmers/Image/2021-09-13_18-13-06.jpg')
```

[14]:



[16]:
```
'''
What we would like to do before combining the data is to have a name column␣
 ↪that tells us which stock
that row of data refers to, and that's what this script does.
'''

import pandas as pd
from glob import glob
```

[27]:
```
'''
Next we get all the file path for all the CSV's in the data folder.
'''
files = glob('data/*.csv')
'''
Next, I instantiate a variable called full_df to none, and this is the variable␣
 ↪that will store our
data frame as we accumulate data from each of the CSV.
'''
full_df = None
'''
Next, we enter a loop to loop through all the CSV.
Inside this loop, we load in the current CSV by calling pd.read_csv(f).
'''

for f in files:
    if not os.path.exists("sp500full.csv"):
        print(f)
        df = pd.read_csv(f)
```

```
        #get the symbol name from CSV file name and set and Dataframe name␣
↪column
        symbol = f.split('/')[1].split('.')[0]
        '''
        Next, we create a new column called Name, and we assign it the value␣
↪symbol, which we just obtained.
        This will assign the same value to every row in the current data frame.
        '''
        df['Name'] = symbol
        '''
        Next, we check whether full_df is none if it is, then we can just␣
↪assign full deserve to be the current
        data frame.
        Otherwise we call the append function passing in the current data frame␣
↪D.F. and assign the result to
        '''
        if full_df is None:
            full_df = df
        else:
            full_df = full_df.append(df, ignore_index=True)
#we save the dataframe
if not os.path.exists("sp500full.csv"):
    full_df.to_csv('sp500full.csv', index=False)
```

```
data/CSCO.csv
data/UAL.csv
data/TROW.csv
data/ISRG.csv
data/PRGO.csv
data/TPR.csv
data/DVN.csv
data/MRO.csv
data/BA.csv
data/VRTX.csv
data/GILD.csv
data/NLSN.csv
data/EQIX.csv
data/MDT.csv
data/V.csv
data/QRVO.csv
data/A.csv
data/MO.csv
data/SWKS.csv
data/MCHP.csv
data/CDNS.csv
data/WLTW.csv
data/CHTR.csv
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data/EIX.csv
data/BBY.csv
data/WBA.csv
data/HCA.csv
data/AJG.csv
data/DTE.csv
data/C.csv
data/T.csv
data/CF.csv
data/DISH.csv
data/MGM.csv
data/HUM.csv
data/CBOE.csv
data/CFG.csv
data/WU.csv
data/APH.csv
data/SYY.csv
data/MSI.csv
data/FCX.csv
data/ADM.csv
data/LH.csv
data/PKI.csv
data/LNT.csv
data/BAC.csv
data/LNC.csv
data/PSX.csv
data/GPN.csv
data/SRCL.csv
data/PPG.csv
data/IRM.csv
data/IQV.csv
data/ESS.csv
data/NOV.csv
data/NAVI.csv
data/HAL.csv
data/STZ.csv
data/FLS.csv
data/DXC.csv
data/ADI.csv
data/F.csv
data/HOG.csv
data/ADBE.csv
data/TDG.csv
data/ULTA.csv
data/ARE.csv
data/SYK.csv
data/CB.csv
data/TSN.csv

data/FLR.csv
data/PEP.csv
data/PEG.csv
data/LLY.csv
data/COST.csv
data/REG.csv
data/NWS.csv
data/LOW.csv
data/MDLZ.csv
data/FMC.csv
data/XEL.csv
data/AIZ.csv
data/PDCO.csv
data/CERN.csv
data/MET.csv
data/FTV.csv
data/DLR.csv
data/XRAY.csv
data/SCG.csv
data/FAST.csv
data/TJX.csv
data/SNA.csv
data/MPC.csv
data/D.csv
data/CA.csv
data/MRK.csv
data/STX.csv
data/NOC.csv
data/BXP.csv
data/KHC.csv
data/IPG.csv
data/UNP.csv
data/ALLE.csv
data/ABBV.csv
data/ORCL.csv
data/ECL.csv
data/ETR.csv
data/EBAY.csv
data/SBUX.csv
data/IR.csv
data/AMT.csv
data/INTU.csv
data/DRE.csv
data/CMA.csv
data/PG.csv
data/CAT.csv
data/MCD.csv
data/MNST.csv

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data/AMZN.csv
data/INTC.csv
data/PNR.csv
data/GLW.csv
data/BDX.csv
data/KMI.csv
data/PWR.csv
data/APTV.csv
data/EXR.csv
data/HOLX.csv
data/EXPD.csv
data/GM.csv
data/TXN.csv
data/VRSK.csv
data/SJM.csv
data/TMO.csv
data/OXY.csv
data/RL.csv
data/CCI.csv
data/MMM.csv
data/MOS.csv
data/HSY.csv
data/JNPR.csv
data/DHI.csv
data/ED.csv
data/ES.csv
data/ADSK.csv
data/IP.csv
data/EXPE.csv
data/KO.csv
data/PCAR.csv
data/WDC.csv
data/PYPL.csv
data/NEE.csv
data/UPS.csv
data/LEG.csv
data/EMR.csv
data/MSFT.csv
data/ANSS.csv
data/CTAS.csv
data/UDR.csv
data/WEC.csv
data/AME.csv
data/HP.csv
data/IT.csv
data/ACN.csv
data/VRSN.csv
data/EW.csv
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data/FL.csv
data/CMG.csv
data/AWK.csv
data/COO.csv
data/SHW.csv
data/HPQ.csv
data/AMAT.csv
data/CCL.csv
data/MLM.csv
data/AVY.csv
data/AAP.csv
data/ATVI.csv
data/EA.csv
data/DE.csv
data/SPG.csv
data/AMD.csv
data/KLAC.csv
data/NDAQ.csv
data/URI.csv
data/WHR.csv
data/PNC.csv
data/KMX.csv
data/WRK.csv
data/BIIB.csv
data/NVDA.csv
data/CHRW.csv
data/ROP.csv
data/IDXX.csv
data/EXC.csv
data/HES.csv
data/HD.csv
data/ALB.csv
data/VLO.csv
data/AON.csv
data/ZTS.csv
data/FDX.csv
data/DG.csv
data/HIG.csv
data/SIG.csv
data/CMS.csv
data/COL.csv
data/CAG.csv
data/INCY.csv
data/SCHW.csv
data/HSIC.csv
data/AZO.csv
data/AXP.csv
data/HPE.csv

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data/DFS.csv
data/SEE.csv
data/HRL.csv
data/SO.csv
data/FRT.csv
data/ZBH.csv
data/CME.csv
data/XOM.csv
data/AMP.csv
data/AMG.csv
data/CVX.csv
data/CMCSA.csv
data/PCG.csv
data/CSRA.csv
data/PNW.csv
data/ICE.csv
data/NFX.csv
data/CTXS.csv
data/TRIP.csv
data/BEN.csv
data/DISCK.csv
data/UHS.csv
data/EMN.csv
data/SBAC.csv
data/ROK.csv
data/NRG.csv
data/NSC.csv
data/NKE.csv
data/FIS.csv
data/VTR.csv
data/MAS.csv
data/RF.csv
data/TAP.csv
data/MAR.csv
data/XYL.csv
data/CMI.csv
data/FB.csv
data/MTD.csv
data/KR.csv
data/PLD.csv
data/IBM.csv
data/USB.csv
data/BSX.csv
data/LKQ.csv
data/FBHS.csv
data/ITW.csv
data/EOG.csv
data/PVH.csv
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data/KMB.csv
data/SPGI.csv
data/NEM.csv
data/WFC.csv
data/ANDV.csv
data/EL.csv
data/GS.csv
data/GD.csv
data/CNP.csv
data/PM.csv
data/RE.csv
data/MCO.csv
data/CLX.csv
data/CAH.csv
data/HRB.csv
data/DGX.csv
data/AVB.csv
data/DIS.csv
data/GE.csv
data/HII.csv
data/ALL.csv
data/ETN.csv
data/ALGN.csv
data/NFLX.csv
data/LEN.csv
data/BHF.csv
data/FITB.csv
data/GWW.csv
data/NTRS.csv
data/CVS.csv
data/AOS.csv
data/FE.csv
data/ABC.csv
data/JPM.csv
data/ABT.csv
data/OMC.csv
data/COF.csv
data/TSCO.csv
data/PH.csv
data/HST.csv
data/AYI.csv
data/JBHT.csv
data/MAC.csv
data/COP.csv
data/DHR.csv
data/COG.csv
data/MAT.csv
data/CNC.csv

data/MCK.csv
data/TXT.csv
data/MTB.csv
data/SPY.csv
data/DISCA.csv
data/AKAM.csv
data/RMD.csv
data/GOOGL.csv
data/PAYX.csv
data/ALK.csv
data/DRI.csv
data/ILMN.csv
data/AAL.csv
data/XLNX.csv
data/MAA.csv
data/MMC.csv
data/EVHC.csv
data/GT.csv
data/FFIV.csv
data/VNO.csv
data/CINF.csv
data/VMC.csv
data/TWX.csv
data/SRE.csv
data/ORLY.csv
data/IVZ.csv
data/RCL.csv
data/PXD.csv
data/COTY.csv
data/SNPS.csv
data/GOOG.csv
data/YUM.csv
data/EQT.csv
data/KSS.csv
data/PFE.csv
data/AIV.csv
data/AVGO.csv
data/DUK.csv
data/REGN.csv
data/CL.csv
data/VFC.csv
data/UA.csv
data/VZ.csv
data/JCI.csv
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data/ADP.csv

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data/AET.csv
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data/STT.csv
data/RRC.csv
data/RSG.csv
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data/GPS.csv
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data/QCOM.csv
data/LYB.csv
data/GIS.csv
data/PHM.csv
data/ROST.csv
data/LUV.csv
data/ALXN.csv
data/XEC.csv
data/MS.csv
data/CPB.csv
data/OKE.csv
data/BK.csv
data/SYF.csv
data/CHD.csv
data/SLG.csv
data/MHK.csv
data/INFO.csv
data/DAL.csv
data/APA.csv
data/K.csv
data/JWN.csv
data/AFL.csv
data/ADS.csv
data/CSX.csv
data/NI.csv
data/PFG.csv
data/NCLH.csv
data/ZION.csv
data/RJF.csv
data/HBAN.csv
data/UNH.csv
data/PRU.csv
data/GPC.csv
data/FISV.csv
data/WMB.csv
data/EQR.csv
data/PBCT.csv
data/KSU.csv
data/DVA.csv
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data/AIG.csv
data/MA.csv
data/HBI.csv
data/HON.csv
data/O.csv
data/NWSA.csv
data/AES.csv
data/SLB.csv
data/XRX.csv
data/TGT.csv
data/AAPL.csv
data/MKC.csv
data/WY.csv
data/APD.csv
data/GRMN.csv
data/AEE.csv
data/HLT.csv
data/DLTR.csv
data/HAS.csv
data/WMT.csv
data/NTAP.csv
data/KIM.csv
data/BAX.csv
data/LMT.csv
data/KEY.csv
data/UNM.csv
data/BMY.csv
data/PSA.csv
data/WYNN.csv
data/RHI.csv
data/EFX.csv
data/NUE.csv
data/PKG.csv
data/CTSH.csv
data/SWK.csv
data/MU.csv
data/TRV.csv
data/L.csv
data/AEP.csv
data/CI.csv
data/SNI.csv
data/JNJ.csv
data/WM.csv
data/DOV.csv
data/FTI.csv
data/M.csv
data/CRM.csv
data/PGR.csv
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data/WAT.csv
data/BWA.csv
data/LRCX.csv
data/NWL.csv
data/UAA.csv
data/BLK.csv
data/PPL.csv
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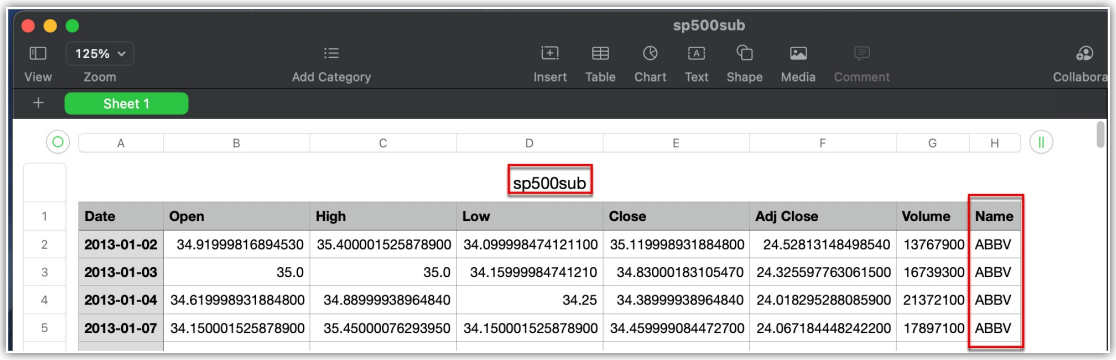
[21]:
```
from IPython.display import Image
Image(filename='/Users/subhasish/GIT/Interstellar/SB-AI-DEV/ML/SB/TimeSeries/
 ↪Lazy Programmers/Image/2021-09-13_18-30-52.jpg')
```

[21]:



	Date	Open	High	Low	Close	Adj Close	Volume	Name
2	2013-01-02	34.91999816894530	35.40000152587890	34.09999847412110	35.11999893188480	24.52813148498540	13767900	ABBV
3	2013-01-03	35.0	35.0	34.15999984741210	34.83000183105470	24.32559776306150	16739300	ABBV
4	2013-01-04	34.61999893188480	34.88999938964840	34.25	34.38999938964840	24.01829528808590	21372100	ABBV
5	2013-01-07	34.15000152587890	35.45000076293950	34.15000152587890	34.45999908447270	24.06718444824220	17897100	ABBV

[24]:
```
import random
'''
Next, we have a set called Small Symbol's, which consists of a few stocks that␣
 ↪I'll be using in this
course, along with a few others from different industries.
'''
small_symbols = {'MMM', 'ABT', 'ABBV', 'ACN', 'ATVI', 'ADBE', 'AMD', 'AAP',␣
 ↪'AES',
                 'AFL', 'AKAM', 'IBM', 'GOOG', 'SBUX', 'AAPL', 'SPY'}

'''
So the point of this is to choose a few stocks from other industries that are␣
 ↪hopefully uncorrelated
So anyway, since I do want a few more stocks to work with, with the help of the␣
 ↪random module, I
sample one hundred more stocks from our symbol's list.
'''
sample = random.sample(symbols, 100)
```

[25]:
```
'''
So the next step is to convert our sample into a set and then do a union of our␣
 ↪two sets.
```

```
As you know, sets can only have unique items, so any duplicates are now gone.
'''
small_symbols = small_symbols | set(sample)
```

[26]:
```
full_df = None
for symbol in small_symbols:
    f = f"data/{symbol}.csv"
    if os.path.exists(f):
        df = pd.read_csv(f)
        df['Name'] = symbol
        if full_df is None:
            full_df = df
        else:
            full_df = full_df.append(df, ignore_index=True)

full_df.to_csv('sp500sub.csv', index=False)
```

[28]:
```
# At the end we get two file which we will work on
from IPython.display import Image
Image(filename='/Users/subhasish/GIT/Interstellar/SB-AI-DEV/ML/SB/TimeSeries/
 ↪Lazy Programmers/Image/2021-09-13_18-42-10.jpg')
```

[28]:

[ ]: