Module 7: Data Wraling With Pandas

CPE 311: Computational Thinking with Python

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7.1 Supplementary Activty

Using the datasets provided, perform the following exercises

Exercise 1

We want to look at data for the Facebook, Apple, Amazon, Netflix, and Google (FAANG) stocks, but we were given each as a separate CSV file. Combine them into a single file and store the dataframe of the FAANG data as faang for the rest of the exercises.

- 1. Read each file in.
- 2. Add a column to each dataframe, called ticker, indicating the ticker symbol it is for (Apple's is AAPL, for example). This is how you look up a stock. Each file's name is also the ticker symbol, so be sure to capitalize it.
- 3. Append them together into a single dataframe.
- 4. Save the result in a CSV file called faang.csv

1. Read each file in

```
import pandas as pd
apple = pd.read_csv('data/aapl.csv') #importing our csv file

import pandas as pd
amazon = pd.read_csv('data/amzn.csv') #importing our csv file

import pandas as pd
facebook = pd.read_csv('data/fb.csv') #importing our csv file

import pandas as pd
google = pd.read_csv('data/goog.csv') #importing our csv file

import pandas as pd
netflix = pd.read_csv('data/nflx.csv') #importing our csv file
```

2. Add a column to each dataframe, called ticker, indicating the ticker symbol it is for (Apple's is AAPL, for example). This is how you look up a stock. Each file's name is also the ticker symbol, so be sure to capitalize it.

AAPL

1 2018-01-03 169.2521 171.2337 168.6929

168.9578 29517899

```
Next steps:
            View recommended plots
amazon.loc[:,"ticker"] = "AMZN"
amazon.head()
             date
                    open
                            high
                                    low
                                          close
                                                 volume ticker
                                                                 \blacksquare
     0 2018-01-02 1172.00 1190.00 1170.51
                                         1189.01
                                                2694494
                                                         AMZN
                                                                 d.
     1 2018-01-03 1188.30
                         1205.49
                                 1188.30
                                        1204.20 3108793
                                                         AMZN
     2 2018-01-04 1205.00
                         1215.87
                                 1204.66
                                        1209.59
                                                3022089
                                                         AMZN
     3 2018-01-05 1217.51 1229.14 1210.00
                                        1229.14
                                                3544743
                                                         AMZN
     4 2018-01-08 1236.00 1253.08 1232.03 1246.87 4279475
 facebook.loc[:,"ticker"] = "FB"
facebook.head()
                                                                \blacksquare
            date
                          high
                                                volume ticker
                   open
                                   low
                                        close
     0 2018-01-02 177.68
                        181.58 177.5500
                                        181.42
                                              18151903
                                                           FΒ
                                                                ıl.
     1 2018-01-03 181.88
                        184.78 181.3300
                                        184.67
                                               16886563
                                                           FΒ
     2 2018-01-04 184.90
                        186.21
                               184.0996
                                        184.33
                                                           FΒ
     3 2018-01-05 185.59
                        186.90
                              184.9300
                                        186.85
                                                           FΒ
     4 2018-01-08
                 187.20 188.90 186.3300 188.28
                                              17994726
                                                           FΒ
 google.loc[:,"ticker"] = "GOOG"
google.head()
                                                                 扁
            date
                            high
                                    low
                                          close
                                                 volume ticker
                    open
     0 2018-01-02 1048.34 1066.94 1045.23 1065.00 1237564
                                                         GOOG
                         1086.29
     1 2018-01-03 1064.31
                                 1063.21
                                         1082.48
                                                1430170
                                                         GOOG
     2 2018-01-04 1088.00
                         1093.57
                                 1084.00
                                         1086.40
                                                1004605
                                                         GOOG
     3 2018-01-05 1094.00
                         1104.25
                                1092.00
                                         1102.23
                                                1279123
     4 2018-01-08 1102.23 1111.27 1101.62 1106.94 1047603
 netflix.loc[:,"ticker"] = "NFLX"
netflix.head()
                          high
                                                                П
                                        close
                                                volume ticker
            date
                   open
                                   low
     0 2018-01-02 196.10 201.65 195.4200 201.07
                                                         NFLX
                                              10966889
                                                                th
     1 2018-01-03 202.05
                        206.21 201.5000 205.05
                                                8591369
                                                         NFLX
     2 2018-01-04 206.20 207.05 204.0006 205.63
                                                         NFLX
                                                6029616
     3 2018-01-05 207.25 210.02 205.5900 209.99
                                                7033240
                                                         NFLX
     4 2018-01-08 210.02 212.50 208.4400 212.05
                                                         NFLX
                                               5580178
 3. Append them together into a single dataframe.
faang = pd.concat([apple, amazon, facebook, google, netflix])
```

	date	open	high	low	close	volume	ticker	
0	2018-01-02	166.9271	169.0264	166.0442	168.9872	25555934	AAPL	
1	2018-01-03	169.2521	171.2337	168.6929	168.9578	29517899	AAPL	
2	2018-01-04	169.2619	170.1742	168.8106	169.7426	22434597	AAPL	
3	2018-01-05	170.1448	172.0381	169.7622	171.6751	23660018	AAPL	
4	2018-01-08	171.0375	172.2736	170.6255	171.0375	20567766	AAPL	
246	2018-12-24	242.0000	250.6500	233.6800	233.8800	9547616	NFLX	
247	2018-12-26	233.9200	254.5000	231.2300	253.6700	14402735	NFLX	
248	2018-12-27	250.1100	255.5900	240.1000	255.5650	12235217	NFLX	
249	2018-12-28	257.9400	261.9144	249.8000	256.0800	10987286	NFLX	
250	2018-12-31	260.1600	270.1001	260.0000	267.6600	13508920	NFLX	
1255 rows × 7 columns								

Next steps:



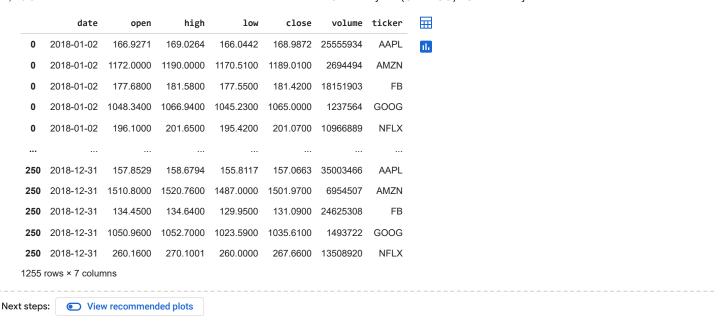
4. Save the result in a CSV file called faang.csv

```
faang.to_csv('data/faang.csv', index = False)
```

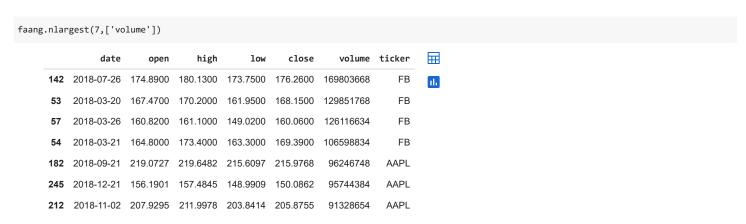
Exercise 2

- 1. With faang, use type conversion to change the date column into a datetime and the volume column into integers. Then sort by date and ticker
- 2. Find the seven rows with the highest value for volume
- 3. Right now, the data is somewhere between long and wide format. Use melt() to make it completely long format. Hint: date and ticker are our ID variables (they uniquely indetify each row). We need to melt the rest so that we don't have separate columns for open, high, low close and volume.
- 1. With faang, use type conversion to change the date column into a datetime and the volume column into integers. Then sort by date and ticker.

```
faang['date'] = pd.to_datetime(faang['date'])
faang.info()
     <class 'pandas.core.frame.DataFrame'>
     Int64Index: 1255 entries, 0 to 250
     Data columns (total 7 columns):
     # Column Non-Null Count Dtype
     0 date 1255 non-null datetime64[ns]
         open
                1255 non-null
                                float64
         high 1255 non-null float64
     3
         low
                 1255 non-null
                                float64
         close 1255 non-null
                                float64
         volume 1255 non-null
                                int64
     6 ticker 1255 non-null
                                object
     \texttt{dtypes: datetime64[ns](1), float64(4), int64(1), object(1)}
     memory usage: 110.7+ KB
faang = faang.sort_values(by = ['date', 'ticker'])
faang
```

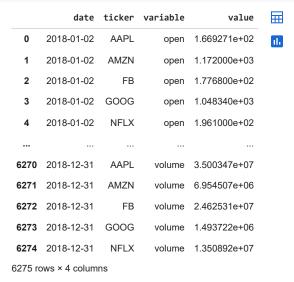


2. Find the seven rows with the highest value for volume



3. Right now, the data is somewhere between long and wide format. Use melt() to make it completely long format. Hint: date and ticker are our ID variables (they uniquely indetify each row). We need to melt the rest so that we don't have separate columns for open, high, low close and volume.

faang = pd.melt(faang, id_vars = ['date', 'ticker'], value_vars = ['open', 'high', 'low', 'close', 'volume'])
faang



Next steps: View recommended plots

Exercise 3

- 1. Using web scraping, search for the list of the hospitals, their address and contact information. Save the list in a new csv file, hospital.csv
- 2. Using the generated hospitals.csv, convert the csv file into pandas dataframe. Prepare the data using the necessary preprocessing techniques
- 1. Using web scraping, search for the list of the hospitals, their address and contact information. Save the list in a new csv file, hospital.csv

```
from bs4 import BeautifulSoup
import requests

url = 'https://en.wikipedia.org/wiki/List_of_hospitals_in_the_Philippines?fbclid=IwAR3tlpYW_R1fYSs4u1BigxwEM2aSjoPBcQcN7wbd-_u-hbrcmXwRZNVC
page = requests.get(url)
soup = BeautifulSoup(page.text, 'html')

print(soup)
```

noopener target-_brank /<u>nttp.//www.saintantnony.com.pn/</u>s/a/x/tu/xtu/xa nrei- <u>nttps.//www.ratebook.com/St-Anthony-Medical-Center-of-Marikina-Inc-897333707012810/</u>" rel="noreferrer noopener" target="_blank"><u>https://www.facebook.com/St-Anthony-Medical-Center-of-</u>

soup.find all('table')

Russia

```
Marikina-Inc-897333707012810/</a>MuntinlupaAsian Hospital and Medical Center8771 9000
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table = soup.find('table', class = 'wikitable')
hospitals = table.find_all('th')
hospitals
print(hospitals)
               [Name of Hospital
               , Location
               , Class
               1
hospitals= pd.DataFrame(columns = [title.text.strip() for title in hospitals])
hospitals
                      Name of Hospital Location Class
```

```
column_data = table.find_all('tr')
print(column_data)
    677 Geronimo St., cor. Carola St., Sampaloc, Manila
    LGU
    , 
    Navotas City Hospital
    M. Naval St., Brgy. San Jose, Navotas City
    LGU
    , 
    Ospital ng Parañaque
    0440 Quirino Ave., La Huerta, Parañaque City
    LGU
    , 
    Ospital ng Parañaque District II
    187 Taiwan Extension Corner Doña Soledad Avenue, Don Bosco, Parañaque City
    LGU
    , 
    Novaliches District Hospital
    Quirino Highway, San Bartolome, Novaliches, Quezon City
    LGU
    , 
    San Juan Medical Center
    N. Domingo St., San Juan City
    LGU
    , 
    Army General Hospital
    Fort Andres Bonifacio, Taguig City
    AFP
    , 
    Manila Naval Hospital
    Naval Station, Jose Francisco, Fort Bonifacion, Taguig City
    AFP
    , 
    Taguig-Pateros District Hospital
    East Service Road, Western Bicutan, Taguig
    LGU
    , 
    <a href="/wiki/Santa_Ana_Hospital,_Manila" title="Santa Ana Hospital, Manila">Santa Ana Hospital</a>
    New Panaderos St., Sta. Ana, Manila
    LGU
for row in column_data:
 row data = row.find all('td')
 individual_row = [data.text.strip() for data in row_data]
 print(individual_row)
    ['Caloocan City Medical Center', '450 A. Mabini St., Caloocan City', 'LGU']
    ['Ospital ng Malabon', 'F. Sevilla Boulevard, Tañong, Malabon City', 'LGU']
    ['San Lorenzo Ruiz General Hospital', 'O. Reyes St., Rosita Subdivision, Santulan, Malabon City', 'DOH Retained']
    ['Gat Andres Bonifacio Memorial Medical Center', '8001 Delpan St., Tondo, Manila', 'LGU']
    ['Ospital ng Tondo', 'Jose Abad Santos Avenue, Tondo, Manila', 'LGU']
['Justice Jose Abad Santos General Hospital', 'Numancia St., Binondo, Manila', 'LGU']
    ['Ospital ng Sampaloc', '677 Geronimo St., cor. Carola St., Sampaloc, Manila', 'LGU']
    ['Navotas City Hospital', 'M. Naval St., Brgy. San Jose, Navotas City', 'LGU']
['Ospital ng Parañaque', '0440 Quirino Ave., La Huerta, Parañaque City', 'LGU']
    ['Ospital ng Parañaque District II', '187 Taiwan Extension Corner Doña Soledad Avenue, Don Bosco, Parañaque City', 'LGU']
     'Novaliches District Hospital', 'Quirino Highway, San Bartolome, Novaliches, Quezon City', 'LGU']
    ['San Juan Medical Center', 'N. Domingo St., San Juan City', 'LGU']
['Army General Hospital', 'Fort Andres Bonifacio, Taguig City', 'AFP']
    ['Manila Naval Hospital', 'Naval Station, Jose Francisco, Fort Bonifacion, Taguig City', 'AFP']
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['Taguig-Pateros District Hospital', 'East Service Road, Western Bicutan, Taguig', 'LGU']
['Santa Ana Hospital', 'New Panaderos St., Sta. Ana, Manila', 'LGU']
['Mandaluyong City Medical Center', '605 Boni Avenue, Mandaluyong City', 'LGU']
['Air Force General Hospital', 'Gozar St., Colonel Jesus Villamor Air Base, Pasay City', 'PAF']
["Pasig City Children's Hospital - Child's Hope", 'Industria St. cor. Alcalde Jose St., Kapasigan, Pasig City', 'LGU']
['PNP General Hospital', 'Camp Crame, Quezon City', 'PNP']
['Rosario Maclang Bautista General Hospital', 'IBP Road, Batasan Hills, District 2, Quezon City', 'LGU']
['Dr. Jose N. Rodriguez Memorial Hospital and Sanitarium', 'St. Joseph Avenue (Dr. Uyguanco Street), Tala, Caloocan City', 'DOH Retaine ['Las Piñas General Hospital and Satellite Trauma Center', 'Bernabe Compound, Pulanglupa, Las Piñas City', 'DOH Retained']
['Dr. Jose Fabella Memorial Hospital', 'Lope de Vega St., Sta. Cruz, Manila', 'DOH Retained']
['Jose R. Reyes Memorial Medical Center', 'San Lazaro Compound, Rizal Avenue, Sta. Cruz, Manila', 'DOH Retained']
['San Lazaro Hospital', 'Quiricada St., Sta. Cruz, Manila', 'DOH Retained']
['Tondo Medical Center', 'Honorio Lopez Boulevard., Balut, Tondo, Manila', 'DOH Retained']
['Philippine General Hospital', 'Taft Avenue, Ermita, Manila', 'University']
['Ospital ng Maynila Medical Center', 'Pres. Quirino Avenue, cor. Roxas Blvd., Malate, Manila', 'LGU']
['National Center for Mental Health', '#9 De Febrero St., Mandaluyong City', 'DOH Retained']
['Ospital ng Makati', 'Sampaguita St. cor. Gumamela St., Brgy. Pembo, Makati City', 'LGU']
 'Amang Rodriguez Memorial Medical Center', 'Sumulong Highway, Brgy. Sto. Niño, Marikina City', 'DOH Retained']
['Ospital ng Muntinlupa', 'Civic Drive, Filinvest Corporate City, Alabang, Muntinlupa City', 'LGU']
['Research Institute for Tropical Medicine', 'Filinvest Corporate City, Alabang, Muntinlupa City', 'DOH Retained']
 'Pasay City General Hospital', 'P. Burgos St., Pasay City', 'LGU']
['Rizal Medical Center', 'Pasig Boulevard, Bagong Ilog, Pasig City', 'DOH Retained']
['Pasig City General Hospital', 'M. Eusebio Avenue, Maybunga, Pasig City', 'LGU']
['Veterans Memorial Medical Center', 'North Avenue, Diliman, Quezon City', 'DND']
['Philippine Heart Center', 'East Avenue, Diliman, Quezon City', 'GOCC']
['National Kidney and Transplant Institute', 'East Avenue, Diliman, Quezon City', 'GOCC']
["Philippine Children's Medical Center", 'Quezon Avenue corner Senator Miriam P. Defensor-Santiago Avenue, Diliman, Quezon City', 'GOCC
['Victoriano Luna Medical Center', 'V. Luna Road, Quezon City', 'AFP']
['East Avenue Medical Center', 'East Avenue, Quezon City', 'DOH Retained']
['Philippine Orthopedic Center', 'Ma. Clara St. cor. Banawe St., Quezon City', 'DOH Retained']
['Quezon City General Hospital', 'Seminary Road, EDSA, Quezon City', 'LGU']
['Lung Center of the Philippines', 'Quezon Avenue, Quezon City', 'GOCC']
['National Children's Hospital', '#226 E. Rodriguez Sr. Boulevard, Quezon City', 'DOH Retained']
['Quirino Memorial Medical Center', 'Katipunan Road, Project 4, Quezon City', 'DOH Retained']
['Valenzuela Medical Center', 'Padrigal St., Karuhatan, Valenzuela City', 'DOH Retained']
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for row in table.find_all('tr')[1:]:
  data = row.find_all('td')
  results = [datas.text.strip() for datas in data]
  hospitals.loc[len(hospitals)] = results
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hospitals

III

	Name of Hospital	Location	Class
0	Caloocan City Medical Center	450 A. Mabini St., Caloocan City	LGU
1	Ospital ng Malabon	F. Sevilla Boulevard, Tañong, Malabon City	LGU
2	San Lorenzo Ruiz General Hospital	O. Reyes St., Rosita Subdivision, Santulan, Ma	DOH Retained
3	Gat Andres Bonifacio Memorial Medical Center	8001 Delpan St., Tondo, Manila	LGU
4	Ospital ng Tondo	Jose Abad Santos Avenue, Tondo, Manila	LGU
5	Justice Jose Abad Santos General Hospital	Numancia St., Binondo, Manila	LGU
6	Ospital ng Sampaloc	677 Geronimo St., cor. Carola St., Sampaloc, M	LGU
7	Navotas City Hospital	M. Naval St., Brgy. San Jose, Navotas City	LGU
8	Ospital ng Parañaque	0440 Quirino Ave., La Huerta, Parañaque City	LGU
9	Ospital ng Parañaque District II	187 Taiwan Extension Corner Doña Soledad Avenu	LGU
10	Novaliches District Hospital	Quirino Highway, San Bartolome, Novaliches, Qu	LGU
11	San Juan Medical Center	N. Domingo St., San Juan City	LGU
12	Army General Hospital	Fort Andres Bonifacio, Taguig City	AFP
13	Manila Naval Hospital	Naval Station, Jose Francisco, Fort Bonifacion	AFP
14	Taguig-Pateros District Hospital	East Service Road, Western Bicutan, Taguig	LGU
15	Santa Ana Hospital	New Panaderos St., Sta. Ana, Manila	LGU
16	Mandaluyong City Medical Center	605 Boni Avenue, Mandaluyong City	LGU
17	Air Force General Hospital	Gozar St., Colonel Jesus Villamor Air Base, Pa	PAF
18	Pasig City Children's Hospital – Child's Hope	Industria St. cor. Alcalde Jose St., Kapasigan	LGU
19	PNP General Hospital	Camp Crame, Quezon City	PNP
20	Rosario Maclang Bautista General Hospital	IBP Road, Batasan Hills, District 2, Quezon City	LGU
21	Dr. Jose N. Rodriguez Memorial Hospital and Sa	St. Joseph Avenue (Dr. Uyguanco Street), Tala,	DOH Retained
22	Las Piñas General Hospital and Satellite Traum	Bernabe Compound, Pulanglupa, Las Piñas City	DOH Retained
23	Dr. Jose Fabella Memorial Hospital	Lope de Vega St., Sta. Cruz, Manila	DOH Retained
24	Jose R. Reyes Memorial Medical Center	San Lazaro Compound, Rizal Avenue, Sta. Cruz,	DOH Retained
25	San Lazaro Hospital	Quiricada St., Sta. Cruz, Manila	DOH Retained
26	Tondo Medical Center	Honorio Lopez Boulevard., Balut, Tondo, Manila	DOH Retained
27	Philippine General Hospital	Taft Avenue, Ermita, Manila	University
28	Ospital ng Maynila Medical Center	Pres. Quirino Avenue, cor. Roxas Blvd., Malate	LGU
29	National Center for Mental Health	#9 De Febrero St., Mandaluyong City	DOH Retained
30	Ospital ng Makati	Sampaguita St. cor. Gumamela St., Brgy. Pembo,	LGU
31	Amang Rodriguez Memorial Medical Center	Sumulong Highway, Brgy. Sto. Niño, Marikina City	
32	Ospital ng Muntinlupa	Civic Drive, Filinvest Corporate City, Alabang	LGU
33	Research Institute for Tropical Medicine	Filinvest Corporate City, Alabang, Muntinlupa	
34	Pasay City General Hospital	P. Burgos St., Pasay City	LGU
35	Rizal Medical Center	Pasig Boulevard, Bagong Ilog, Pasig City	
36	Pasig City General Hospital	M. Eusebio Avenue, Maybunga, Pasig City	LGU
37	Veterans Memorial Medical Center	North Avenue, Diliman, Quezon City	DND
38	Philippine Heart Center	East Avenue, Diliman, Quezon City	GOCC
39	National Kidney and Transplant Institute	East Avenue, Diliman, Quezon City	GOCC
40	Philippine Children's Medical Center	Quezon Avenue corner Senator Miriam P. Defenso	GOCC
41	Victoriano Luna Medical Center	V. Luna Road, Quezon City	AFP
42	East Avenue Medical Center	East Avenue, Quezon City	
43	Philippine Orthopedic Center	Ma. Clara St. cor. Banawe St., Quezon City	
44	Quezon City General Hospital	Seminary Road, EDSA, Quezon City	LGU
45	Lung Center of the Philippines	Quezon Avenue, Quezon City	GOCC