˅ **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.

```
apple.loc[:,"ticker"] = "AAPL"
apple.head()
```

	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

```
amazon.loc[:,"ticker"] = "AMZN"
amazon.head()
```

	date	open	high	low	close	volume	ticker
0	2018-01-02	1172.00	1190.00	1170.51	1189.01	2694494	AMZN
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	AMZN

```
facebook.loc[:,"ticker"] = "FB"
facebook.head()
```

	date	open	high	low	close	volume	ticker
0	2018-01-02	177.68	181.58	177.5500	181.42	18151903	FB
1	2018-01-03	181.88	184.78	181.3300	184.67	16886563	FB
2	2018-01-04	184.90	186.21	184.0996	184.33	13880896	FB
3	2018-01-05	185.59	186.90	184.9300	186.85	13574535	FB
4	2018-01-08	187.20	188.90	186.3300	188.28	17994726	FB

```
google.loc[:,"ticker"] = "GOOG"
google.head()
```

	date	open	high	low	close	volume	ticker
0	2018-01-02	1048.34	1066.94	1045.23	1065.00	1237564	GOOG
1	2018-01-03	1064.31	1086.29	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	GOOG
4	2018-01-08	1102.23	1111.27	1101.62	1106.94	1047603	GOOG

```
netflix.loc[:,"ticker"] = "NFLX"
netflix.head()
```

	date	open	high	low	close	volume	ticker
0	2018-01-02	196.10	201.65	195.4200	201.07	10966889	NFLX
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	6029616	NFLX
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	5580178	NFLX

3. Append them together into a single dataframe.

```
faang = pd.concat([apple, amazon, facebook, google, netflix])
faang
```

	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

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]
 1   open    1255 non-null   float64
 2   high    1255 non-null   float64
 3   low     1255 non-null   float64
 4   close   1255 non-null   float64
 5   volume  1255 non-null   int64
 6   ticker  1255 non-null   object
dtypes: datetime64[ns](1), float64(4), int64(1), object(1)
memory usage: 110.7+ KB
```

```
faang = faang.sort_values(by = ['date', 'ticker'])
faang
```

	date	open	high	low	close	volume	ticker
0	2018-01-02	166.9271	169.0264	166.0442	168.9872	25555934	AAPL
0	2018-01-02	1172.0000	1190.0000	1170.5100	1189.0100	2694494	AMZN
0	2018-01-02	177.6800	181.5800	177.5500	181.4200	18151903	FB
0	2018-01-02	1048.3400	1066.9400	1045.2300	1065.0000	1237564	GOOG
0	2018-01-02	196.1000	201.6500	195.4200	201.0700	10966889	NFLX
...	...	...	...	...	...	...	...
250	2018-12-31	157.8529	158.6794	155.8117	157.0663	35003466	AAPL
250	2018-12-31	1510.8000	1520.7600	1487.0000	1501.9700	6954507	AMZN
250	2018-12-31	134.4500	134.6400	129.9500	131.0900	24625308	FB
250	2018-12-31	1050.9600	1052.7000	1023.5900	1035.6100	1493722	GOOG
250	2018-12-31	260.1600	270.1001	260.0000	267.6600	13508920	NFLX

1255 rows × 7 columns

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

```
faang.nlargest(7,['volume'])
```

	date	open	high	low	close	volume	ticker
142	2018-07-26	174.8900	180.1300	173.7500	176.2600	169803668	FB
53	2018-03-20	167.4700	170.2000	161.9500	168.1500	129851768	FB
57	2018-03-26	160.8200	161.1000	149.0200	160.0600	126116634	FB
54	2018-03-21	164.8000	173.4000	163.3000	169.3900	106598834	FB
182	2018-09-21	219.0727	219.6482	215.6097	215.9768	96246748	AAPL
245	2018-12-21	156.1901	157.4845	148.9909	150.0862	95744384	AAPL
212	2018-11-02	207.9295	211.9978	203.8414	205.8755	91328654	AAPL

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
```

	date	ticker	variable	value
0	2018-01-02	AAPL	open	1.669271e+02
1	2018-01-02	AMZN	open	1.172000e+03
2	2018-01-02	FB	open	1.776800e+02
3	2018-01-02	GOOG	open	1.048340e+03
4	2018-01-02	NFLX	open	1.961000e+02
...	...	...	...	...
6270	2018-12-31	AAPL	volume	3.500347e+07
6271	2018-12-31	AMZN	volume	6.954507e+06
6272	2018-12-31	FB	volume	2.462531e+07
6273	2018-12-31	GOOG	volume	1.493722e+06
6274	2018-12-31	NFLX	volume	1.350892e+07

6275 rows × 4 columns

∨ **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://sulit.ph/list-of-hospitals-in-metro-manila-with-contact-details-website-and-social-media-accounts/?fbclid=IwAR3LdKuNs9vPMHm9lXg
page = requests.get(url)
soup = BeautifulSoup(page.text, 'html')
```

```
print(soup)
```

```
</script>
<script async="" id="eio-lazy-load-js" src="https://buy.sulit.tech/wp-content/plugins/ewww-image-optimizer/includes/lazysizes.min.js":
<script id="chatbot-script-js-extra">
var embeddedChatbotConfig = {"chatbotId":"wZ0oNZscLkdYSjttxUKXi","domain":"www.chatbase.co"};
</script>
<script defer="" id="chatbot-script-js" src="https://www.chatbase.co/embed.min.js"></script>
<script defer="" id="wp-polyfill-inert-js" src="https://buy.sulit.tech/wp-includes/js/dist/vendor/wp-polyfill-inert.min.js"></script>
<script defer="" id="regenerator-runtime-js" src="https://buy.sulit.tech/wp-includes/js/dist/vendor/regenerator-runtime.min.js"></scri
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<script id="wp-hooks-js" src="https://buy.sulit.tech/wp-includes/js/dist/hooks.min.js"></script>
<script id="wp-i18n-js" src="https://buy.sulit.tech/wp-includes/js/dist/i18n.min.js"></script>
<script defer="" id="wp-i18n-js-after" src="data:text/javascript,wp.i18n.setLocaleData({'text direction\u0004ltr':['ltr']})"></script:
<script id="wp-url-js" src="https://buy.sulit.tech/wp-includes/js/dist/url.min.js"></script>
<script id="wp-api-fetch-js" src="https://buy.sulit.tech/wp-includes/js/dist/api-fetch.min.js"></script>
<script defer="" id="wp-api-fetch-js-after" src='data:text/javascript,wp.apiFetch.use(wp.apiFetch.createRootURLMiddleware("https://su:
<script id="ultp-script-js-extra">
var ultp_data_frontend = {"url":"https:\/\/sulit.ph\/wp-content\/plugins\/ultimate-post\/","ajax":"https:\/\/sulit.ph\/wp-admin\/admin
</script>
<script defer="" id="ultp-script-js" src="https://buy.sulit.tech/wp-content/plugins/ultimate-post/assets/js/ultp.min.js"></script>
<script id="kadence-navigation-js-extra">
var kadenceConfig = {"screenReader":{"expand":"Child menu","expandOf":"Child menu of","collapse":"Child menu","collapseOf":"Child menu
</script>
<script async="" id="kadence-navigation-js" src="https://buy.sulit.tech/wp-content/themes/kadence/assets/js/navigation.min.js"></scri
<script defer="" id="seopress-cookies-js" src="https://buy.sulit.tech/wp-content/plugins/wp-seopress/assets/js/seopress-cookies.min.j:
<script id="seopress-cookies-ajax-js-extra">
var seopressAjaxGAUserConsent = {"seopress_nonce":"3ead80cbd5","seopress_cookies_user_consent":"https:\/\/sulit.ph\/wp-admin\/admin-a:
</script>
<script defer="" id="seopress-cookies-ajax-js" src="https://buy.sulit.tech/wp-content/plugins/wp-seopress/assets/js/seopress-cookies-:
<script id="socialsnap-js-js-extra">
var socialsnap_script = {"ajaxurl":"https:\/\/sulit.ph\/wp-admin\/admin-ajax.php","on_media_width":"250","on_media_height":"250","nonc
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</script>
<script defer="" id="socialsnap-js-js" src="https://buy.sulit.tech/wp-content/plugins/socialsnap-agency/assets/js/socialsnap.js"></sc:
<div class="popup-drawer popup-drawer-layout-fullwidth" data-drawer-target-string="#search-drawer" id="search-drawer">
<div class="drawer-overlay" data-drawer-target-string="#search-drawer"></div>
<div class="drawer-inner">
<div class="drawer-header">
<button aria-expanded="false" aria-label="Close search" class="search-toggle-close drawer-toggle" data-set-focus=".search-toggle-open'
<span class="kadence-svg-iconset"><svg class="kadence-svg-icon kadence-close-svg" fill="currentColor" height="24" version="1.1" viewbc
</svg></span> </button>
</div>
<div class="drawer-content">
<form action="https://sulit.ph/" class="search-form" method="get" role="search">
<label>
<span class="screen-reader-text">Search for:</span>
<input class="search-field" name="s" placeholder="Search …" type="search" value=""/>
</label>
<input class="search-submit" type="submit" value="Search"/>
<div class="kadence-search-icon-wrap"><span class="kadence-svg-iconset"><svg aria-hidden="true" class="kadence-svg-icon kadence-search
</svg></span></div></form> </div>
</div>
</div>
<script defer="" src="data:text/javascript,var SocialSnapURL=window.location.href;var SocialSnapShareCacheExpired=1;var SocialSnapShar
SocialSnapBrowserTimestamp=Math.floor(SocialSnapBrowserTimestamp/1000);SocialSnapShareCacheExpired=SocialSnapShareCacheExpired&amp;&am
<script data-cfasync="false" data-no-defer="1" data-no-minify="1" data-no-optimize="1">function SWISRemoveCriticalCSS(){var e;document
</html>
```

```python
soup.find_all('table')
```

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target="_blank">http://www.maniladoctors.com.ph/</td><td><a href="https://www.facebook.com/maniladoctorshospital/"
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target="_blank">http://marychiles.com/</td><td><a href="https://www.facebook.com/marychileshospitalinc/" rel="noreferrer
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rel="noreferrer noopener" target="_blank">http://www.armmc.doh.gov.ph/</td><td>https://www.facebook.com/OfficialARMMC</td></tr>
<tr><td>Marikina / Pasig</td><td>Marikina Doctors Hospital</td><td>8535-3934</td><td><a href="http://www.marikinadoctors.com/"
rel="noreferrer noopener" target="_blank">http://www.marikinadoctors.com/</td><td><a
href="https://www.facebook.com/MarDocsPasig/" rel="noreferrer noopener" target="_blank">https://www.facebook.com/MarDocsPasig/
</td></tr><tr><td>Marikina</td><td>Marikina Valley Medical Center</td><td>86822222</td><td><a
href="http://www.marikinavalleymedicalcenter.com/?fbclid=IwAR3r28XMlyEV2XZ9gnb13vMfReIoo8XUzzll2Si7FRxL5jB7IVX9wwQa4_A"
rel="noreferrer noopener" target="_blank">http://www.marikinavalleymedicalcenter.com/</td><td><a
href="https://www.facebook.com/MarikinaValleyMedicalCenter/" rel="noreferrer noopener"
target="_blank">https://www.facebook.com/MarikinaValleyMedicalCenter/</td></tr><tr><td>Marikina</td><td>St. Anthony Medical
Center Of Marikina, Inc.</td><td>682 2000, 6823240, 6822000</td><td><a href="http://www.saintanthony.com.ph/" rel="noreferrer

```python
table = soup.find('table')
```

```python
hospitals = table.find_all('th')
hospitals
print(hospitals)
```

```
[<th>CITY</th>, <th>NAME OF HOSPITAL</th>, <th>CONTACT NUMBER</th>, <th>WEBSITE / EMAIL</th>, <th>FACEBOOK LINK</th>]
```

```python
hospitals= pd.DataFrame(columns = [title.text.strip() for title in hospitals])
hospitals
```

CITY	NAME OF HOSPITAL	CONTACT NUMBER	WEBSITE / EMAIL	FACEBOOK LINK

```python
column_data = table.find_all('th')
print(column_data)
```

```
[<th>CITY</th>, <th>NAME OF HOSPITAL</th>, <th>CONTACT NUMBER</th>, <th>WEBSITE / EMAIL</th>, <th>FACEBOOK LINK</th>]
```

```
hosp_col = soup.find_all('th')
print(hosp_col)
```

```
[<th>CITY</th>, <th>NAME OF HOSPITAL</th>, <th>CONTACT NUMBER</th>, <th>WEBSITE / EMAIL</th>, <th>FACEBOOK LINK</th>]
```

```
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
```

```
hospitals
```

	CITY	NAME OF HOSPITAL	CONTACT NUMBER	WEBSITE / EMAIL	FACEBOOK LINK
0	LIST UPDATE				
1	15 SEPT 2021				
2	Caloocan	Caloocan City Medical Center	South 5310 7925, North 8282 3397, 0943 216 6963		https://www.facebook.com/Caloocan-City-Medical...
3	Caloocan	Dr. Jose N. Rodriguez Memorial Hospital and Sa...	0966 549 2697, 8294 2571 to 73	http://djnrmh.doh.gov.ph/	https://www.facebook.com/officialDJNRMHS
4	Caloocan	MCU – FDT Medical Foundations Hospital	8367 2031	https://www.mcuhospital.org/	
...	...	...	...	...	...
191	Taguig	Medical Center of Taguig	8888 6284		https://www.facebook.com/mctadminofficial/
192	Valenzuela	Allied Care Experts (ACE) Medical Center	direct line to Admission 0917 844 3654, 8332 0...		https://www.facebook.com/ACEMC-Valenzuela-Offi...
193	Valenzuela	Fatima University Medical	8291 6538		

Next steps: 🔘 **View recommended plots**

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

2. Using the generated hospitals.csv, convert the csv file into pandas dataframe. Prepare the data using the necessary preprocessing techniques

7.2 Conclusion