stocks

May 31, 2020

[1]:
```
import numpy as np
import pandas as pd
import gspread
from google.oauth2.service_account import Credentials
from gspread_pandas import Spread, Client
import seaborn as sns
import matplotlib.pyplot as plt
```

[2]:
```
%matplotlib inline
```

[3]:
```
url = 'https://en.wikipedia.org/wiki/List_of_S%26P_500_companies'
stocks_df = pd.read_html(url, header=0)[0]
stocks_df.head()
```

[3]:

	Symbol	Security	SEC filings	GICS Sector	GICS Sub Industry	Headquarters Location	Date first added	CIK	Founded
0	MMM	3M Company	reports	Industrials	Industrial Conglomerates	St. Paul, Minnesota	1976-08-09	66740	1902
1	ABT	Abbott Laboratories	reports	Health Care	Health Care Equipment	North Chicago, Illinois	1964-03-31	1800	1888
2	ABBV	AbbVie Inc.	reports	Health Care	Pharmaceuticals	North Chicago, Illinois	2012-12-31	1551152	2013 (1888)
3	ABMD	ABIOMED Inc	reports	Health Care	Health Care Equipment	Danvers, Massachusetts	2018-05-31	815094	1981
4	ACN	Accenture plc	reports	Information Technology	IT Consulting & Other Services	Dublin, Ireland	2011-07-06	1467373	1989

[4]:
```
stocks_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
```

```
RangeIndex: 505 entries, 0 to 504
Data columns (total 9 columns):
Symbol                   505 non-null object
Security                 505 non-null object
SEC filings              505 non-null object
GICS Sector              505 non-null object
GICS Sub Industry        505 non-null object
Headquarters Location    505 non-null object
Date first added         408 non-null object
CIK                      505 non-null int64
Founded                  234 non-null object
dtypes: int64(1), object(8)
memory usage: 35.6+ KB
```

[5]:
```
stocks_df[stocks_df['Security'].str.contains('Class')]
```

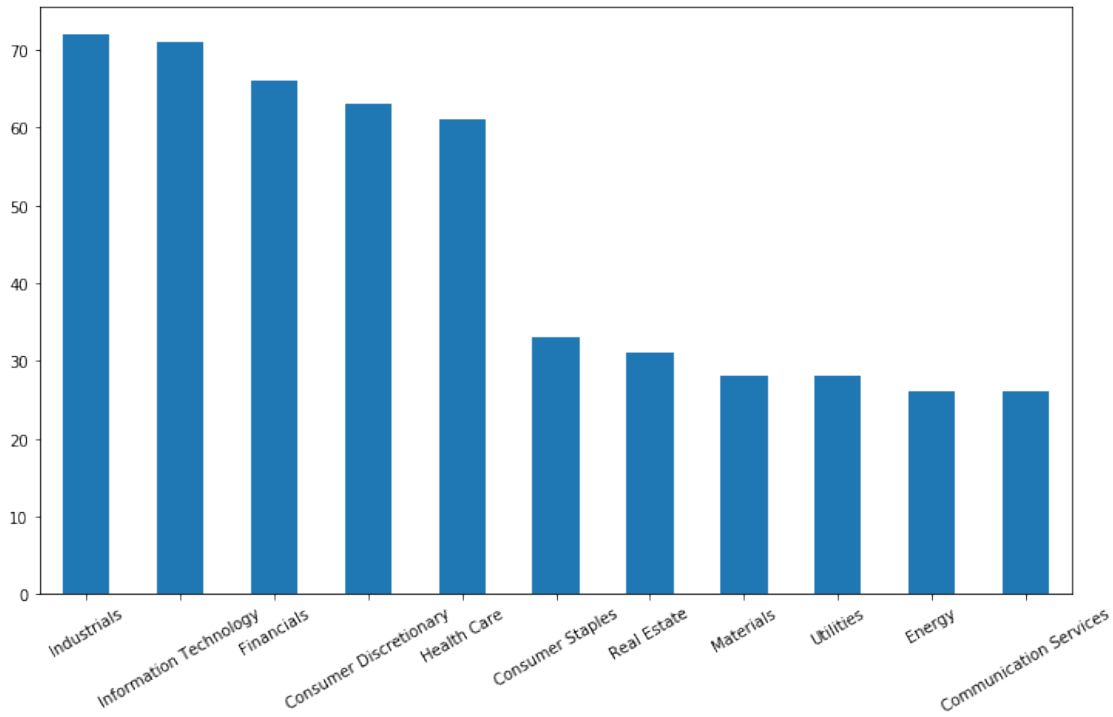
[5]:

	Symbol	Security	SEC filings	GICS Sector	GICS Sub Industry	Headquarters Location	Date first added	CIK	Founded
23	GOOGL	Alphabet Inc. (Class A)	reports	Communication Services	Interactive Media & Services	Mountain View, California	2014-04-03	1652044	1998
24	GOOG	Alphabet Inc. (Class C)	reports	Communication Services	Interactive Media & Services	Mountain View, California	2006-04-03	1652044	1998
147	DISCA	Discovery, Inc. (Class A)	reports	Communication Services	Broadcasting	Silver Spring, Maryland	2010-03-01	1437107	NaN
148	DISCK	Discovery, Inc. (Class C)	reports	Communication Services	Broadcasting	Silver Spring, Maryland	2014-08-07	1437107	NaN
203	FOXA	Fox Corporation (Class A)	reports	Communication Services	Movies & Entertainment	New York, New York	2013-07-01	1308161	NaN
204	FOX	Fox Corporation (Class B)	reports	Communication Services	Movies & Entertainment	New York, New York	2015-09-18	1308161	NaN
338	NWSA	News Corp. Class A	reports	Communication Services	Publishing	New York, New York			
339	NWS	News Corp. Class B	reports	Communication Services	Publishing	New York, New York			
456	UAA	Under Armour (Class A)	reports	Consumer Discretionary	Apparel, Accessories & Luxury Goods	Baltimore, Maryland			
457	UA	Under Armour (Class C)	reports	Consumer Discretionary	Apparel, Accessories & Luxury Goods	Baltimore, Maryland			

```
338        2013-08-01  1564708      NaN
339        2015-09-18  1564708      NaN
456        2014-05-01  1336917      NaN
457        2016-04-08  1336917      NaN
```

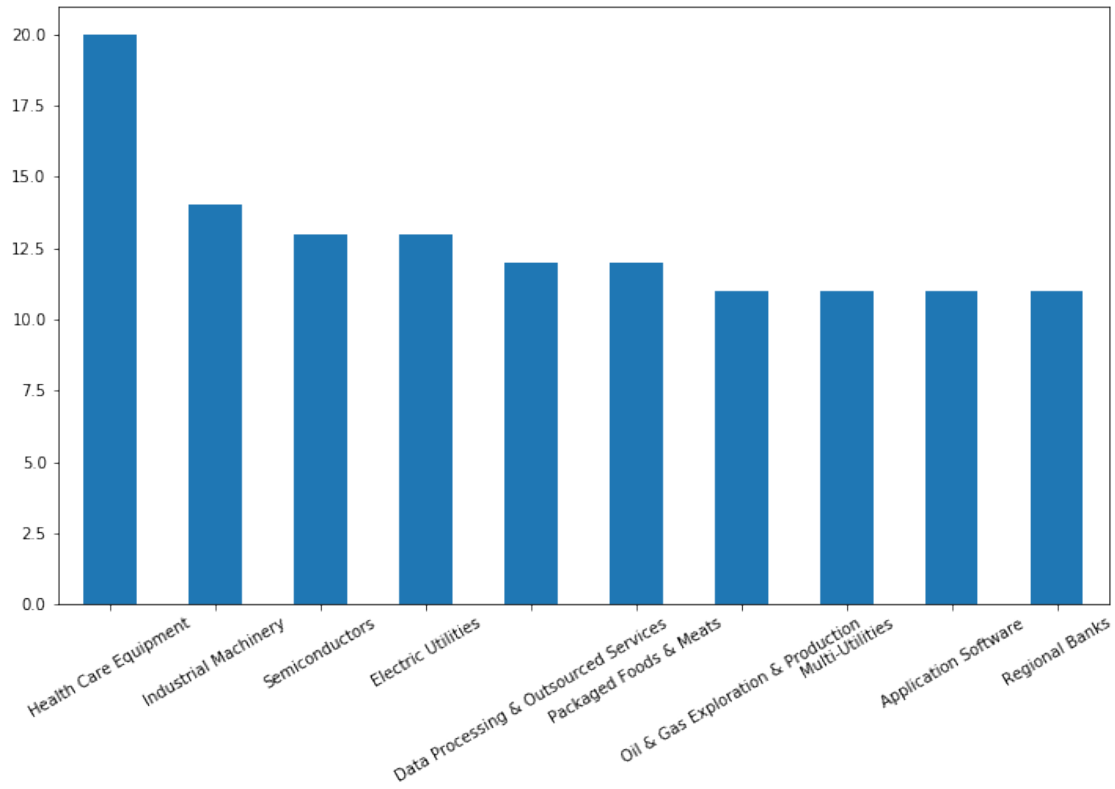
[6]:
```
plt.figure(figsize=(12, 7))
stocks_df['GICS Sector'].value_counts().sort_values(ascending=False).plot(
    kind='bar', rot=30)
```

[6]: <matplotlib.axes._subplots.AxesSubplot at 0x27cc3f72848>



[7]:
```
plt.figure(figsize=(12, 7))
stocks_df['GICS Sub Industry'].value_counts().sort_values(
    ascending=False).head(10).plot(
        kind='bar', rot=30)
```

[7]: <matplotlib.axes._subplots.AxesSubplot at 0x27cc6165f48>



[8]:
```
stocks_df['Price_1_1'] = stocks_df['Symbol'].apply(
    lambda x: '=INDEX(GOOGLEFINANCE("' + x + '","Price", "1/1/2020"),2,2)')
stocks_df['Price_3_23'] = stocks_df['Symbol'].apply(
    lambda x: '=INDEX(GOOGLEFINANCE("' + x + '","Price", "3/23/2020"),2,2)')
stocks_df['Price_4_9'] = stocks_df['Symbol'].apply(
    lambda x: '=INDEX(GOOGLEFINANCE("' + x + '","Price", "4/9/2020"),2,2)')
```

[9]:
```
stocks_df['Shares'] = stocks_df['Symbol'].apply(lambda x: '=GOOGLEFINANCE("' +
                                                x + '","shares")')
```

[10]:
```
scope = [
    'https://spreadsheets.google.com/feeds',
    'https://www.googleapis.com/auth/drive'
]
credentials = Credentials.from_service_account_file(
    'credentials.json', scopes=scope)
```

[11]:
```
client = Client(scope=scope, creds=credentials)
spread = Spread('stocks-data', client=client)
```

[12]:
```
cols_to_keep = [
    'Symbol', 'Security', 'GICS Sector', 'GICS Sub Industry', 'Price_1_1',
    'Price_3_23', 'Price_4_9', 'Shares'
]
```

[13]:
```
spread.df_to_sheet(stocks_df[cols_to_keep])
```

[14]:
```
stocks_df = spread.sheet_to_df()
stocks_df.head()
```

[14]:

index	Symbol	Security	GICS Sector	GICS Sub Industry	Price_1_1	Price_3_23	Price_4_9	Shares
0	MMM	3M Company	Industrials	Industrial Conglomerates	180	117.87	147.78	575196000
1	ABT	Abbott Laboratories	Health Care	Health Care Equipment	86.95	62.82	86.04	1768845000
2	ABBV	AbbVie Inc.	Health Care	Pharmaceuticals	89.55	64.5	79.75	1762342000
3	ABMD	ABIOMED Inc	Health Care	Health Care Equipment	168.81	132.34	160.08	44957000
4	ACN	Accenture plc	Information Technology	IT Consulting & Other Services	210.15	143.69	177.92	637027000

[15]:
```
for index, values in stocks_df.iteritems():
    for i,v in values.items():
        if '#N/A' in v:
            stocks_df.drop(i, inplace=True)
```

[16]:
```
stocks_df[['Price_1_1', 'Price_3_23', 'Price_4_9', 'Shares']] = stocks_df[[
    'Price_1_1', 'Price_3_23', 'Price_4_9', 'Shares'
]].apply(pd.to_numeric)
```

[17]:
```
stocks_df['Marketcap_1_1'] = stocks_df['Price_1_1'] * stocks_df['Shares']
stocks_df['Marketcap_3_23'] = stocks_df['Price_3_23'] * stocks_df['Shares']
stocks_df['Marketcap_4_9'] = stocks_df['Price_4_9'] * stocks_df['Shares']
```

[18]:
```
stocks_df['PercentageChange_3_23_1_1'] = (
    stocks_df['Price_3_23'] -
    stocks_df['Price_1_1']) / stocks_df['Price_1_1'] * 100
stocks_df['PercentageChange_4_9_3_23'] = (
    stocks_df['Price_4_9'] -
    stocks_df['Price_3_23']) / stocks_df['Price_3_23'] * 100
stocks_df['PercentageChange_4_9_1_1'] = (
    stocks_df['Price_4_9'] -
    stocks_df['Price_1_1']) / stocks_df['Price_1_1'] * 100
```

[19]:
```
sum(stocks_df['Marketcap_3_23'] - stocks_df['Marketcap_1_1']) / 10**9
```

[19]:
```
-8627.15056690704
```

[20]:
```
sum(stocks_df['Marketcap_4_9'] - stocks_df['Marketcap_3_23']) / 10**9
```

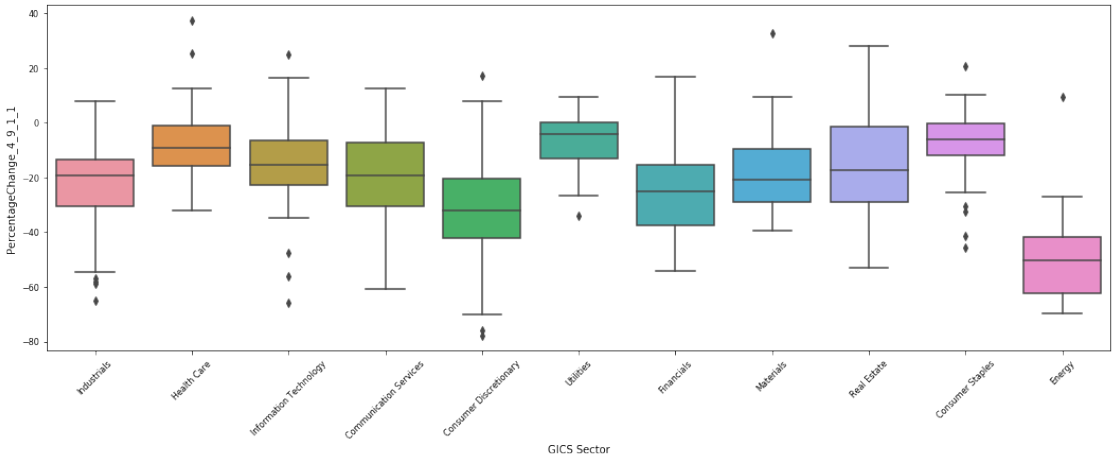
[20]:
```
4700.058910201679
```

[21]:
```
sum(stocks_df['Marketcap_4_9'] - stocks_df['Marketcap_1_1']) / 10**9
```

[21]:
```
-3927.09165670536
```

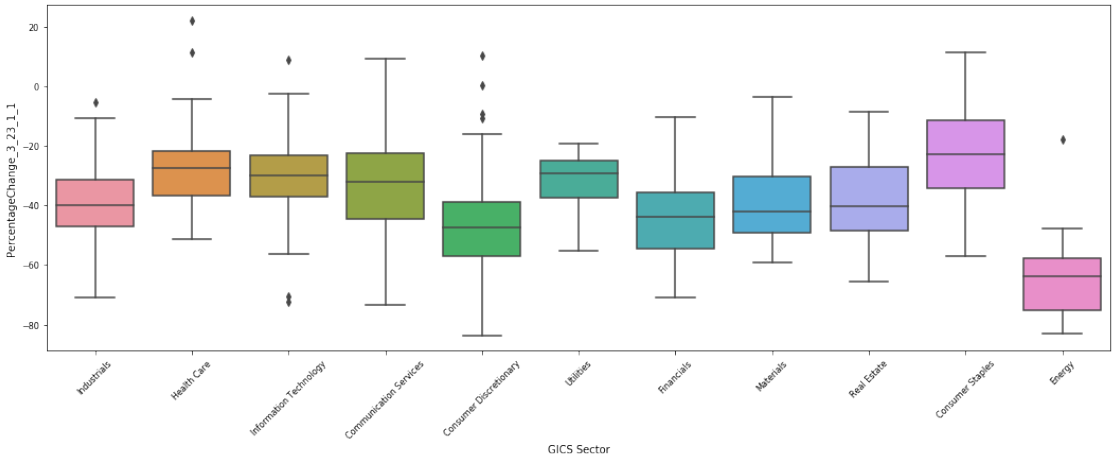
[22]:
```
plt.figure(figsize=(18, 6))
plt.tick_params('both', labelsize='8')
plt.xticks(rotation=45)
sns.boxplot(
    x=stocks_df['GICS Sector'], y=stocks_df['PercentageChange_4_9_1_1'])
```

[22]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x27cc62f7d88>
```



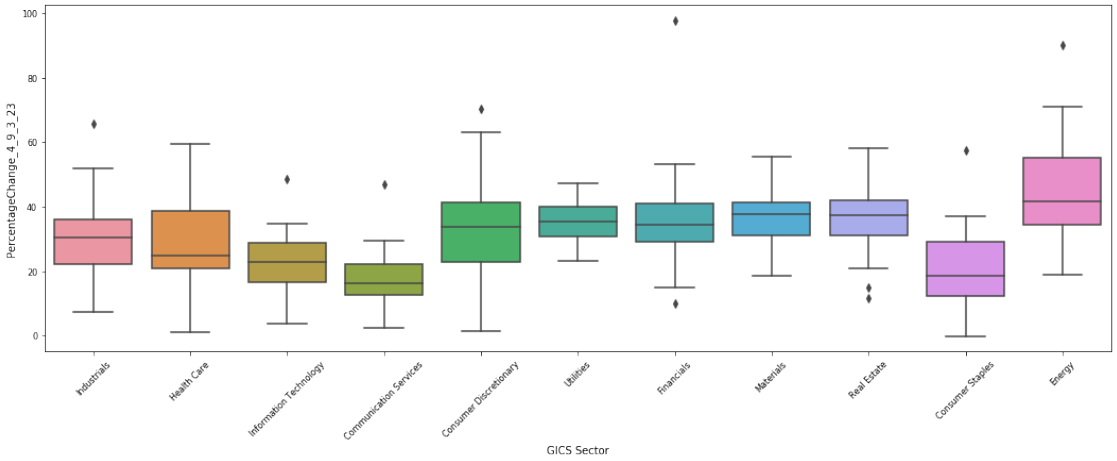
[23]:
```
plt.figure(figsize=(18, 6))
plt.tick_params('both', labelsize='8')
plt.xticks(rotation=45)
sns.boxplot(
    x=stocks_df['GICS Sector'], y=stocks_df['PercentageChange_3_23_1_1'])
```

[23]: <matplotlib.axes._subplots.AxesSubplot at 0x27cc69a4288>



[24]:
```
plt.figure(figsize=(18, 6))
plt.tick_params('both', labelsize='8')
plt.xticks(rotation=45)
sns.boxplot(
    x=stocks_df['GICS Sector'], y=stocks_df['PercentageChange_4_9_3_23'])
```

[24]: <matplotlib.axes._subplots.AxesSubplot at 0x27cc6837148>



[25]:
```
plt.figure(figsize=(18, 6))
plt.tick_params('both', labelsize='8')
stocks_df.groupby('GICS Sub Industry').mean(
)['PercentageChange_4_9_1_1'].sort_values().plot.bar()
```

[25]: <matplotlib.axes._subplots.AxesSubplot at 0x27cc697ab08>