# LabSession_DataVisualisation

September 20, 2022

[6]:
```
import pandas as pd
import seaborn as sns
import plotly.express as px
import matplotlib.pyplot as plt
```

[7]:
```
import plotly.io as pio
pio.renderers.default = "plotly_mimetype+notebook"
```

## 1 Matplotlib

For this excercise, we have written the following code to load the stock dataset built into plotly express.

[9]:
```
stocks = px.data.stocks()
stocks.head()
```

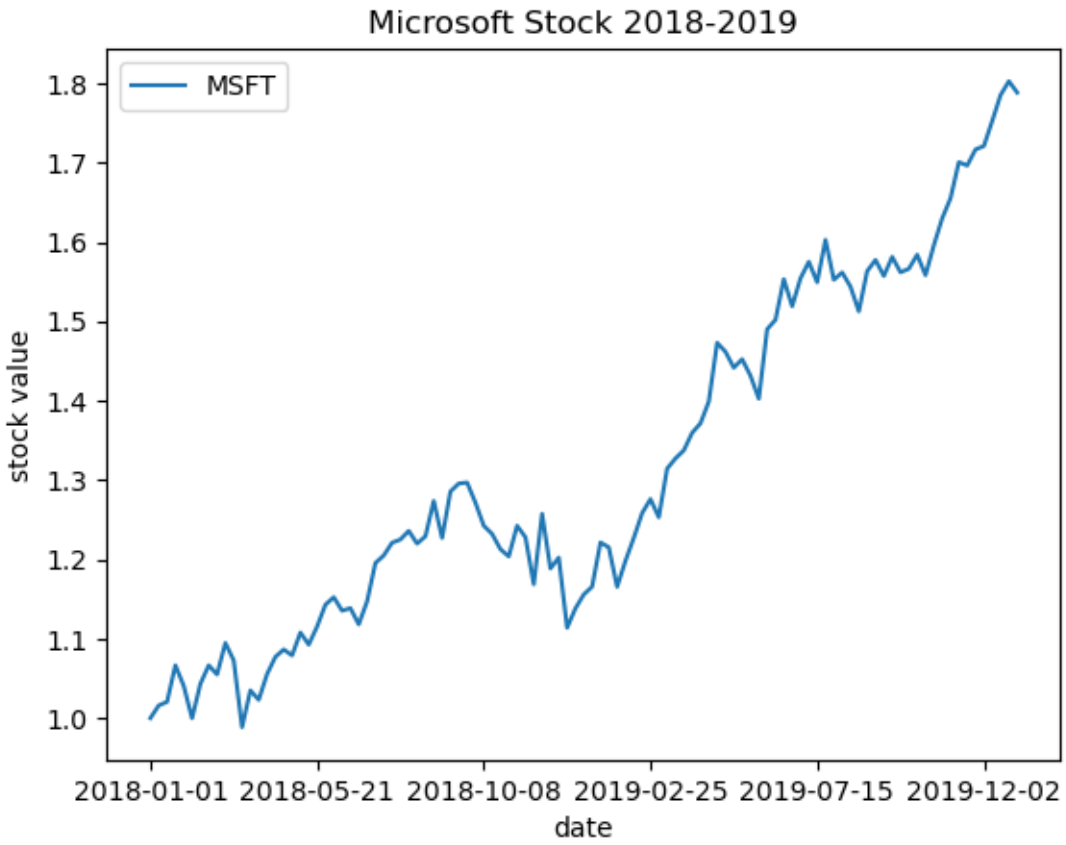
[9]:

| | date | GOOG | AAPL | AMZN | FB | NFLX | MSFT |
|---|---|---|---|---|---|---|---|
| 0 | 2018-01-01 | 1.000000 | 1.000000 | 1.000000 | 1.000000 | 1.000000 | 1.000000 |
| 1 | 2018-01-08 | 1.018172 | 1.011943 | 1.061881 | 0.959968 | 1.053526 | 1.015988 |
| 2 | 2018-01-15 | 1.032008 | 1.019771 | 1.053240 | 0.970243 | 1.049860 | 1.020524 |
| 3 | 2018-01-22 | 1.066783 | 0.980057 | 1.140676 | 1.016858 | 1.307681 | 1.066561 |
| 4 | 2018-01-29 | 1.008773 | 0.917143 | 1.163374 | 1.018357 | 1.273537 | 1.040708 |

### 1.1 Question 1:

Select a stock and create a suitable plot for it. Make sure the plot is readable with relevant information, such as date, values.

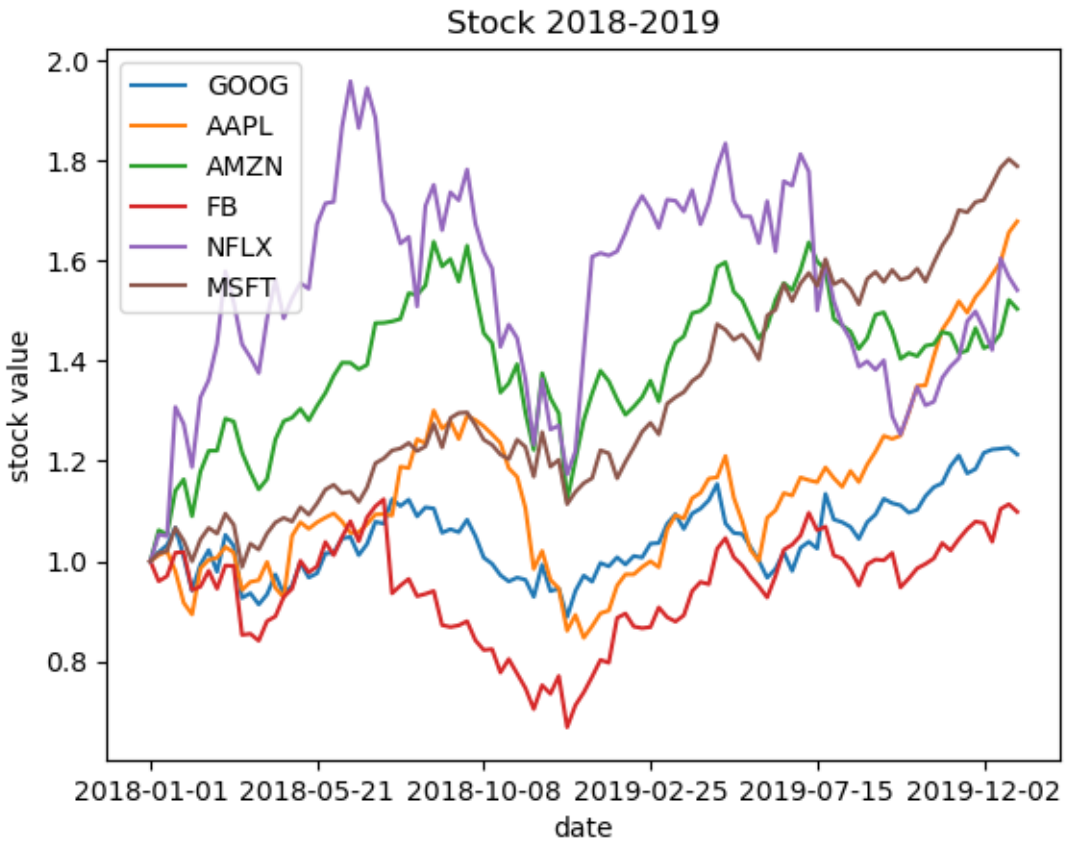
[74]:
```
# YOUR CODE HERE
stocks.plot(x='date',y='MSFT')
plt.title('Microsoft Stock 2018-2019')
plt.ylabel('stock value')
plt.show()
```




### 1.2 Question 2:

You've already plot data from one stock. It is possible to plot multiples of them to support comparison.
To highlight different lines, customise line styles, markers, colors and include a legend to the plot.

[11]:
```
stocks.plot(x='date', y=['GOOG','AAPL', 'AMZN','FB', 'NFLX', 'MSFT'])
plt.title('Stock 2018-2019')
plt.ylabel('stock value')
plt.show()
```




## 2 Seaborn

First, load the tips dataset

[12]:
```
tips = sns.load_dataset('tips')
tips.head()
```

[12]:

| | total_bill | tip | sex | smoker | day | time | size |
|---|---|---|---|---|---|---|---|
| 0 | 16.99 | 1.01 | Female | No | Sun | Dinner | 2 |
| 1 | 10.34 | 1.66 | Male | No | Sun | Dinner | 3 |
| 2 | 21.01 | 3.50 | Male | No | Sun | Dinner | 3 |
| 3 | 23.68 | 3.31 | Male | No | Sun | Dinner | 2 |
| 4 | 24.59 | 3.61 | Female | No | Sun | Dinner | 4 |

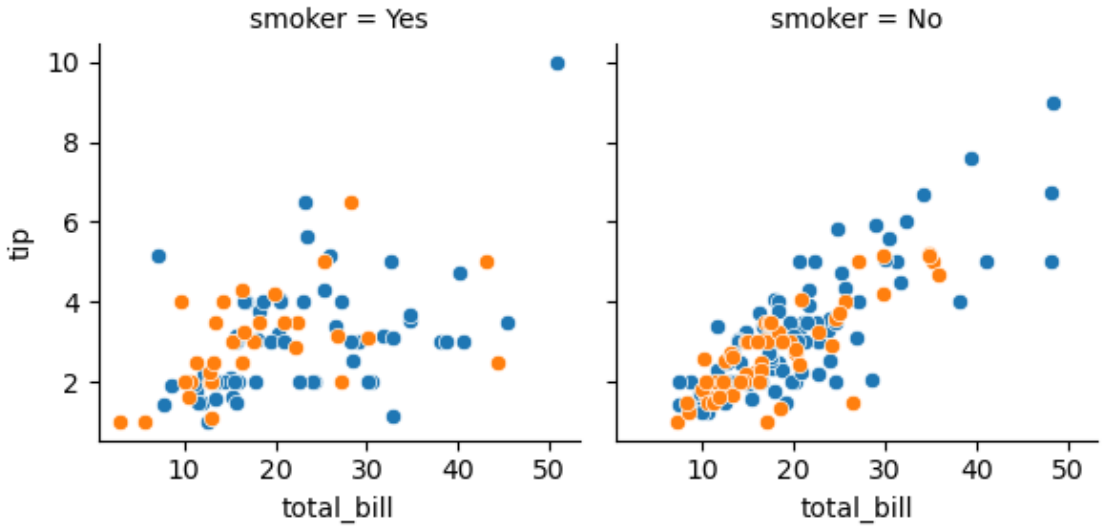
### 2.1 Question 3:

Let's explore this dataset. Pose a question and create a plot that support drawing answers for your question.

Some possible questions: - Are there differences between male and female when it comes to giving tips? - What attribute correlate the most with tip?

[73]:
```
# Question: which group shows the tendency to give more tip? Smokers or␣
↪Non-smokers?
g = sns.FacetGrid(tips, col='smoker', hue='sex')
g.map(sns.scatterplot, 'total_bill', 'tip')
plt.savefig('smoker.png', dpi=300)
plt.show()

# Answer: Non-smokers
```




# 3 Plotly Express

## 3.1 Question 4:

Redo the above exercises (challenges 2 & 3) with plotly express. Create diagrams which you can interact with.

### 3.1.1 The stocks dataset

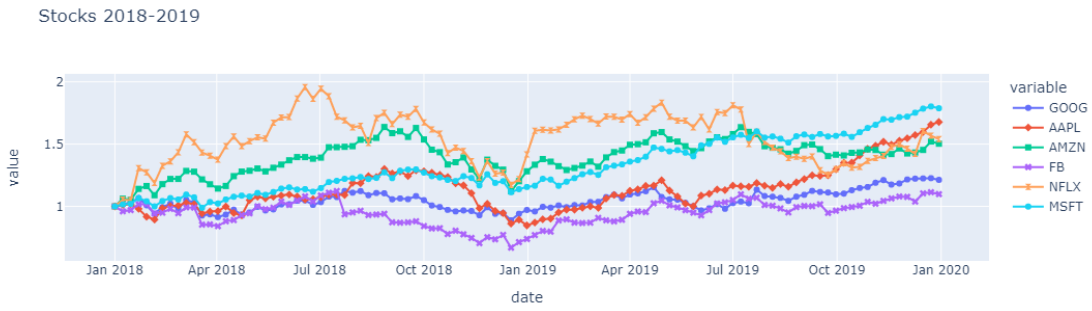
*Hints*: - Turn stocks dataframe into a structure that can be picked up easily with plotly express

[75]:
```
# YOUR CODE HERE -> markers belum diganti based on line
df = px.data.stocks()
fig = px.line(df, x='date', y=['GOOG','AAPL', 'AMZN','FB', 'NFLX', 'MSFT'],␣
↪markers=True, title='Stocks 2018-2019')


# Changing Marker for each line
fig.for_each_trace(
```

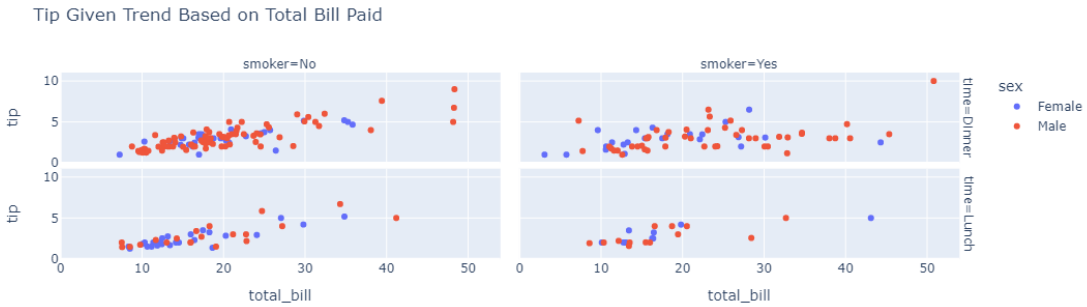
```
    lambda trace: trace.update(marker_symbol="diamond") if trace.name == "AAPL"␣
 ↪else(),
)
fig.for_each_trace(
    lambda trace: trace.update(marker_symbol="square") if trace.name == "AMZN"␣
 ↪else(),
)
fig.for_each_trace(
    lambda trace: trace.update(marker_symbol="x") if trace.name == "FB" else(),
)
fig.for_each_trace(
    lambda trace: trace.update(marker_symbol="hourglass") if trace.name ==␣
 ↪"NFLX" else(),
)

fig.show()
```




### 3.1.2 The tips dataset

[16]:
```
# YOUR CODE HERE
df = px.data.tips()
fig = px.scatter(df, x='total_bill', y='tip', title='Tip Given Trend Based on␣
 ↪Total Bill Paid', color='sex', facet_col='smoker', facet_row='time')
fig.show()
```




### 3.2 Question 5:

Recreate the barplot below that shows the population of different continents for the year 2007.

*Hints:*

- Extract the 2007 year data from the dataframe. You have to process the data accordingly
- use plotly bar
- Add different colors for different continents
- Sort the order of the continent for the visualisation. Use axis layout setting
- Add text to each bar that represents the population

[17]:
```
#load data
df = px.data.gapminder()
df.head()
```

[17]:
```
       country continent  year  lifeExp       pop   gdpPercap iso_alpha  \
0  Afghanistan      Asia  1952   28.801   8425333  779.445314       AFG
1  Afghanistan      Asia  1957   30.332   9240934  820.853030       AFG
2  Afghanistan      Asia  1962   31.997  10267083  853.100710       AFG
3  Afghanistan      Asia  1967   34.020  11537966  836.197138       AFG
4  Afghanistan      Asia  1972   36.088  13079460  739.981106       AFG

   iso_num
0        4
1        4
2        4
3        4
4        4
```

[78]:
```
# Extract data
df = px.data.gapminder()
df_2007 = df.query('year==2007')
df_2007_new = df_2007.groupby('continent').sum()
```

```
# Use plotly bar
fig = px.bar(df_2007_new,  x="pop", y=df_2007_new.index, orientation='h',␣
 ↪color= df_2007_new.index,
    text_auto='.2s', title='Population of the World in 2007 Based on Continents'
    )
fig.update_yaxes(categoryorder='max ascending')

fig.show()
```