```
In [1]:  ▶  %matplotlib inline
            import pandas as pd
            import seaborn as sns
            import plotly.express as px

            import matplotlib pyplot as plt
```

```
In [2]:  ▶  import plotly.io as pio
            pio renderers default = "plotly mimetype+notebook"
```

Matplotlib

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

```
In [3]:  ▶  stocks = px.data.stocks()
            stocks head()
```

Out[3]:

|	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

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.

In [6]: ▶|
```python
#Creating a line chart showing the stock value of Google over time

stocks.plot(x='date', y='GOOG')
plt.xlabel('date')
plt.ylabel('stock value')
```
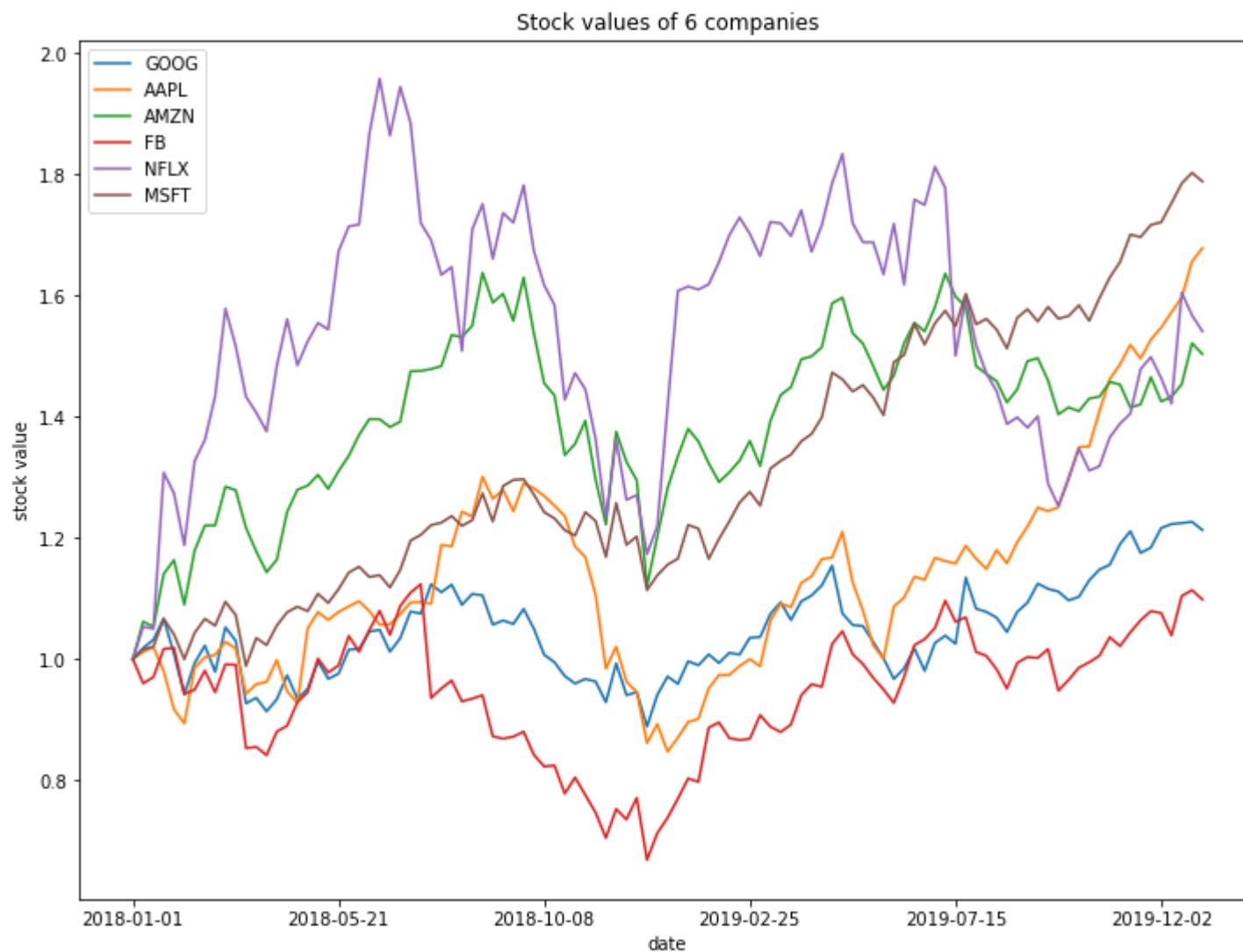
Out[6]: Text(0, 0.5, 'stock value')
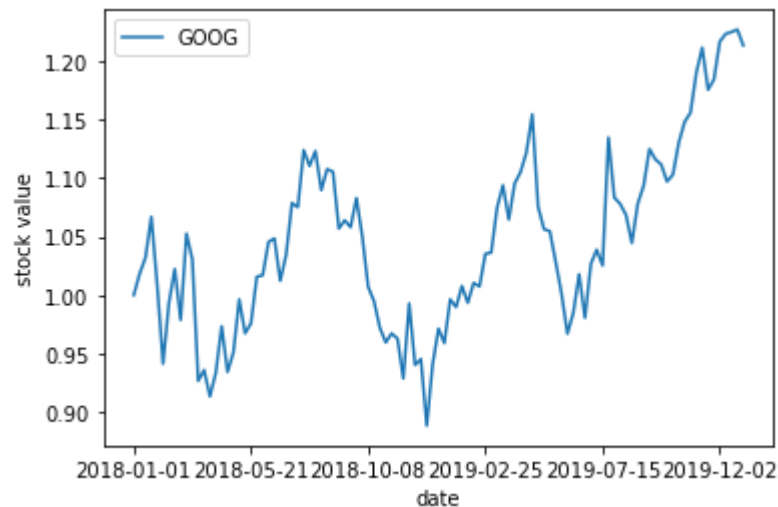
Question 2:

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.

In [8]:

```python
#Creating a line chart showing the stock value of six different companies over time

stocks.plot(x='date', figsize=(12, 9))

plt.xlabel('date')
plt.ylabel('stock value')

plt.title(label="Stock values of 6 companies")
```

Out[8]: Text(0.5, 1.0, 'Stock values of 6 companies')

Seaborn

First, load the tips (https://github.com/mwaskom/seaborn-data/blob/master/tips.csv) dataset

In [16]:
```python
tips = sns.load_dataset('tips')
tips.head()
```

Out[16]:

|	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

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?

In [28]: ▶|
```
#Creating a boxplot to answer the question below.

# Question: Does the tip depend on the group size?
# Answer: Yes the bigger the group, the higher the tip

tips.boxplot(by ='size', column =['tip'], grid = False)
```

Out[28]: <AxesSubplot:title={'center':'tip'}, xlabel='size'>

Boxplot grouped by size
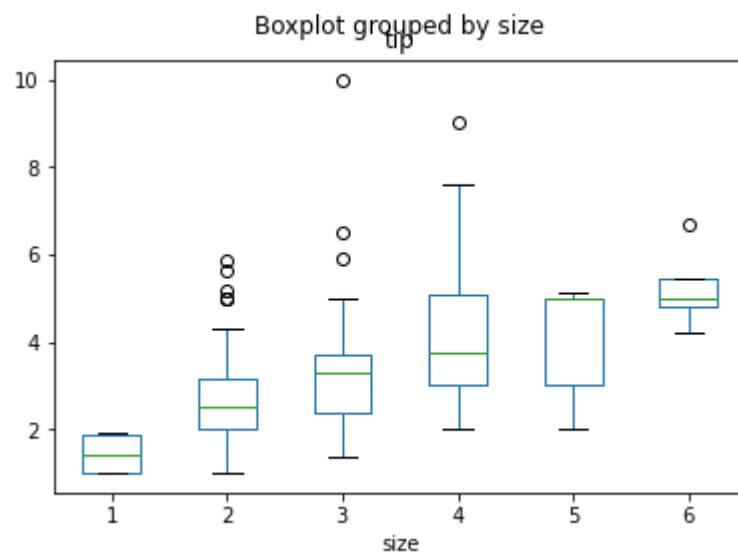
Plotly Express

Question 4:

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

The stocks dataset

Hints:

Turn stock dataframe into a structure that can be picked up easily with plotly express

In [6]: ▶| `stocks.head()`

Out[6]:

|	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

In [12]:

```python
#Creating a line chart using plotly express

fig = px.line(stocks, x='date', y=stocks.keys())
#fig = px.line(stocks, x='date', y='GOOG')
fig.show()
```
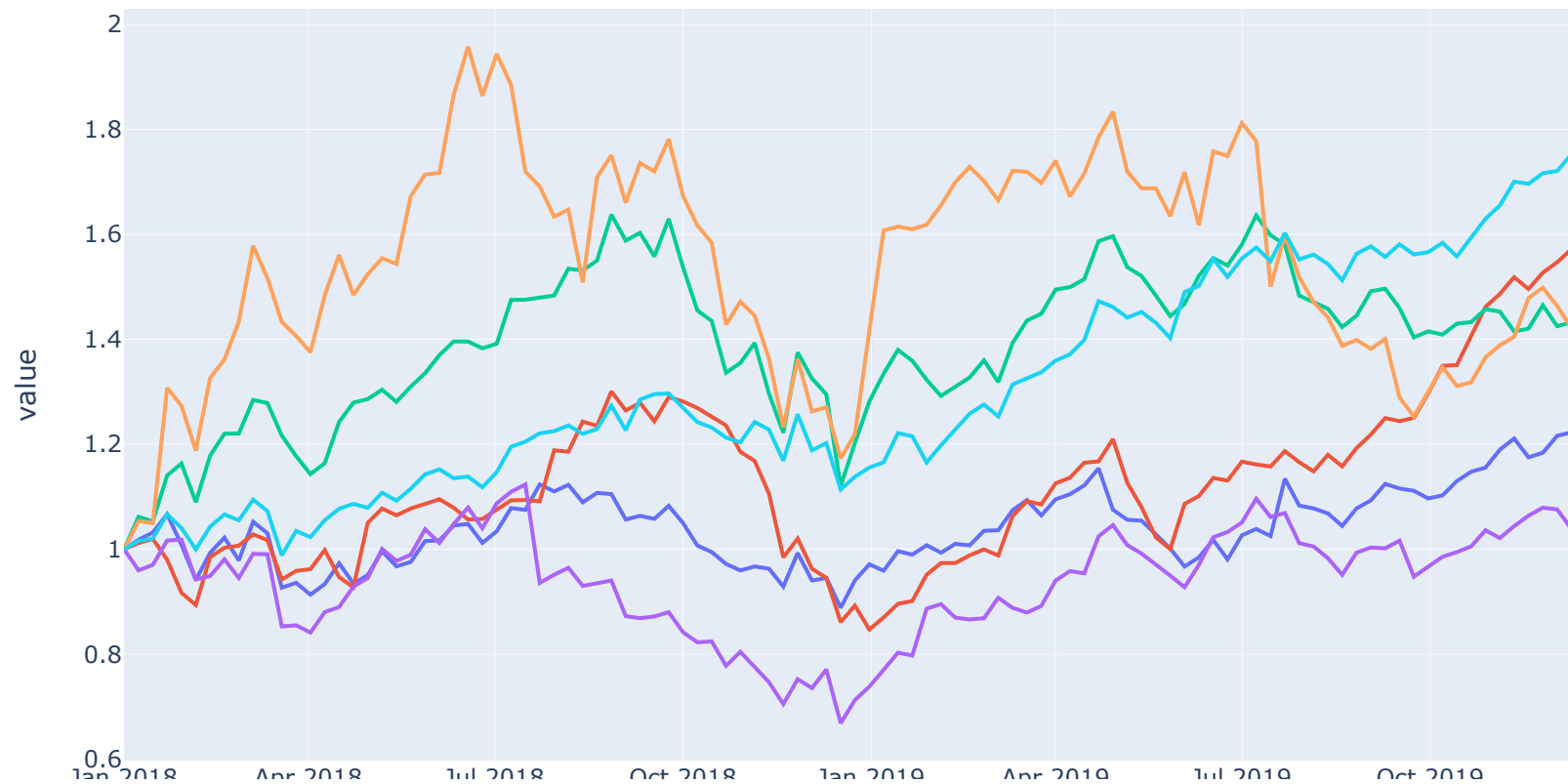

The tips dataset

In [29]: ▶|
```python
#Creating a boxplot using plotly express

# Question: Does the total tip depend on the group size?
# Answer: Yes the bigger the group, the higher the tip

fig = px.box(datatips, x="size", y="tip")
fig.show()
```
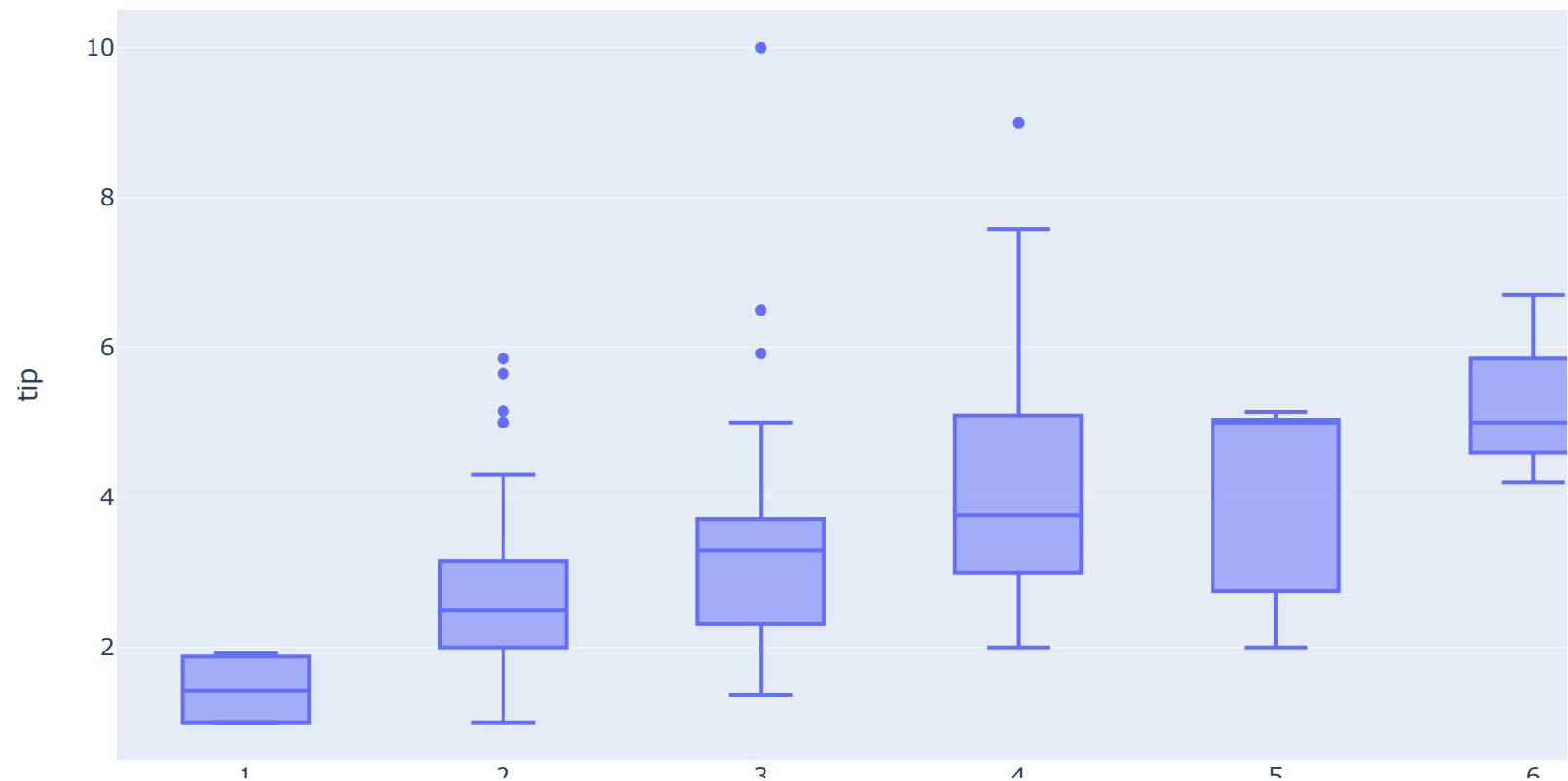
Question 5:

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 (https://plotly.com/python-api-reference/generated/plotly.express.bar)](https://plotly.com/python-api-reference/generated/plotly.express.bar)
- Add different colors for different continents
- Sort the order of the continent for the visualisation. Use [axis layout setting (https://plotly.com/python/reference/layout/xaxis/)](https://plotly.com/python/reference/layout/xaxis/)
- Add text to each bar that represents the population

In [13]: ▶
```python
#Load data
df = px.data.gapminder()
df head()
```

Out[13]:

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

In [32]:

```python
#Creating a bar diagram showing the population per continent

df_2007 = df.query('year==2007')
df_2007_new = df_2007.groupby('continent').sum()

fig = px.bar(df_2007_new, x="pop", orientation='h', color = df_2007_new.index)

fig.show()
```

In [ ]: ▶|