In [1]:

```
import pandas as pd
import seaborn as sns
```

```
C:\Users\Daan\Anaconda3\lib\site-packages\statsmodels\tools\_testing.py:19: FutureWarning:
pandas.util.testing is deprecated. Use the functions in the public API at pandas.testing instead.
  import pandas.util.testing as tm
```

In [2]:

```
import plotly.express as px

import matplotlib.pyplot as plt
```

In [3]:

```
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 [4]:

```
stocks = px.data.stocks()
stocks.head()
```

Out[4]:

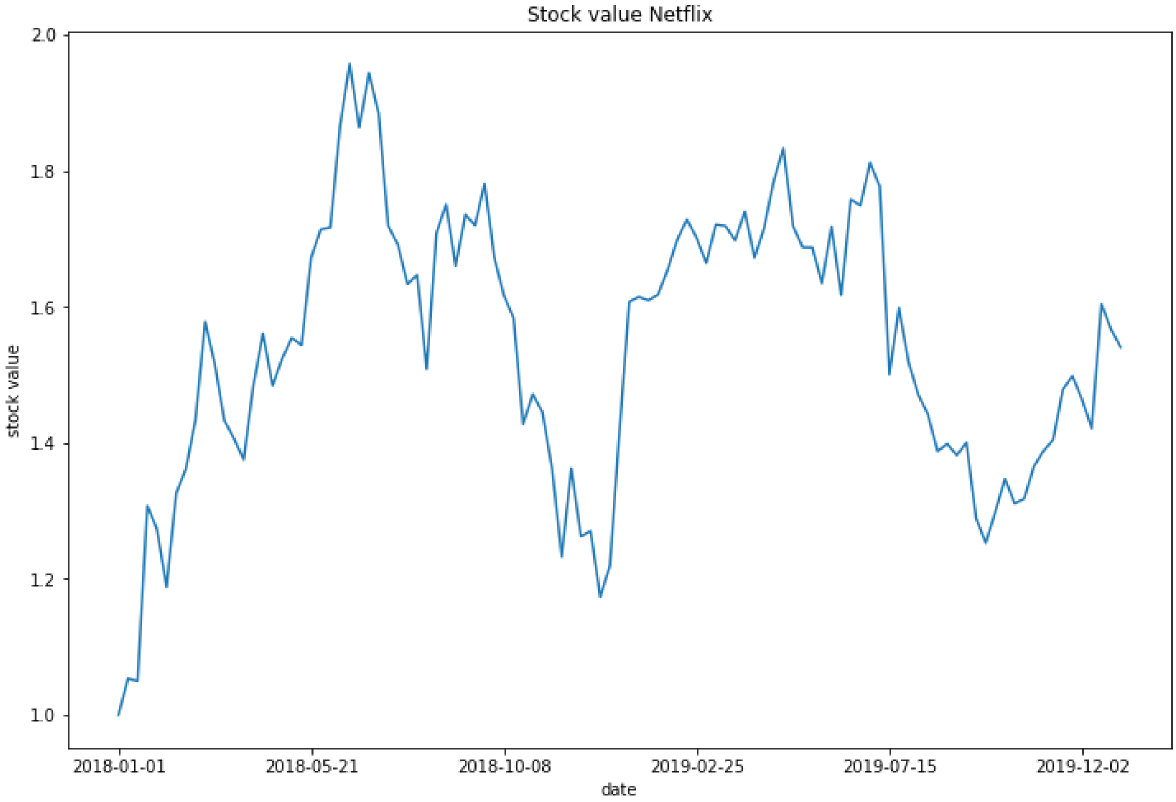
| | date | GOOG | AAPL | AMZN | FB | NFLX | MSFT |
|---|---|---|---|---|---|---|---|
| **0** | 2018-01-01 | 1.000000 | 1.000000 | 1.000000 | 1.000000 | 1.000000 | 1.000000 |
| **1** | 2018-01-08 | 1.018172 | 1.011943 | 1.061881 | 0.959968 | 1.053526 | 1.015988 |
| **2** | 2018-01-15 | 1.032008 | 1.019771 | 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 [5]:

```
stocks.plot(x = 'date', y = 'NFLX', figsize = (12, 8))
plt.ylabel('stock value')
plt.title('Stock value Netflix')
plt.legend('',frameon=False);
```

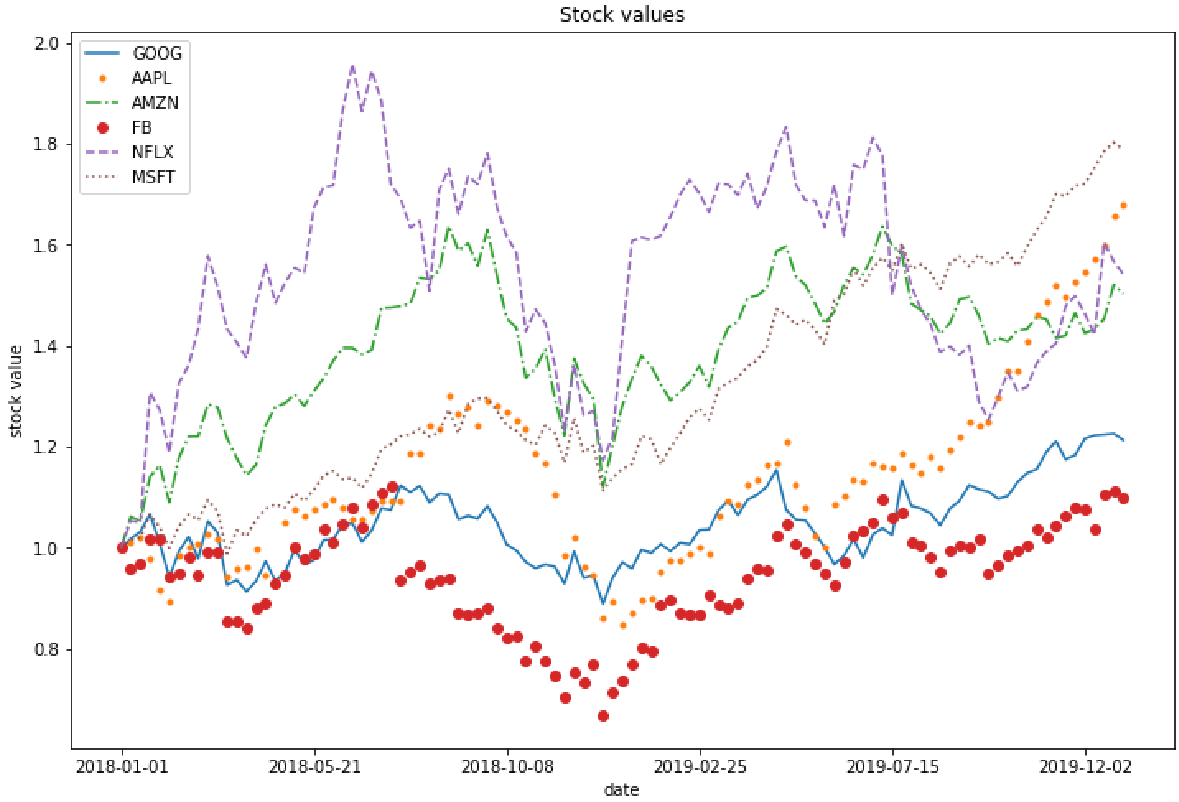


# Question 2:

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 [6]:

```
stocks.plot(x ='date', figsize = (12, 8), style = ['-', '.', '-.', 'o', '--', ':'])
plt.ylabel('stock value')
plt.title('Stock values');
```



# Seaborn

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

In [7]:

```
tips = sns.load_dataset('tips')
tips.head()
```

Out[7]:

| | 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:

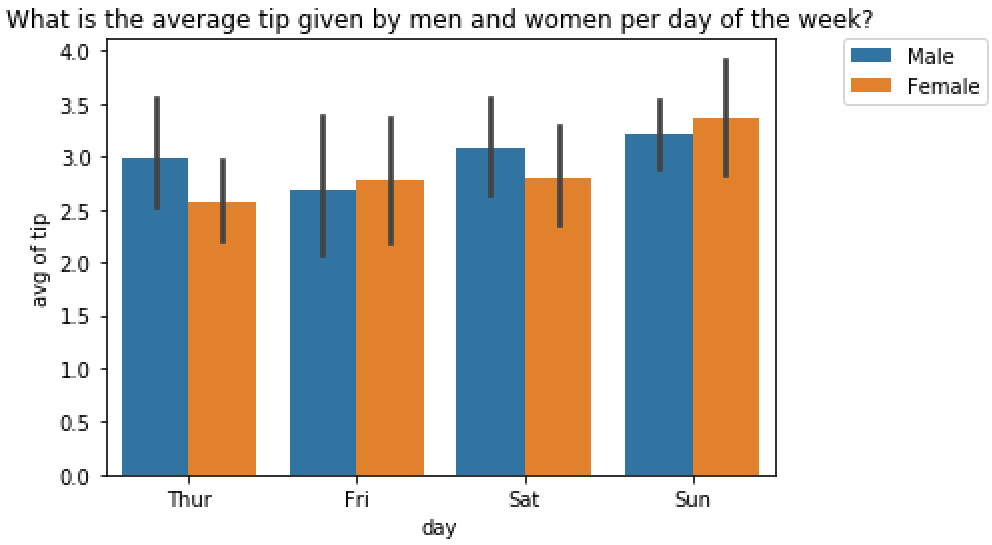
Let's explore this dataset. Pose a question and create a plot that support drawing answers for your question.

Some possible questions:

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

In [8]:

```
fig = sns.barplot(x = 'day', y = 'tip', hue = 'sex', data = tips)
fig.set(ylabel = 'avg of tip')
plt.legend(bbox_to_anchor=(1.1, 1), loc=2, borderaxespad=0.)
plt.title('What is the average tip given by men and women per day of the week?');
```



# Plotly Express

## Question 4:

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

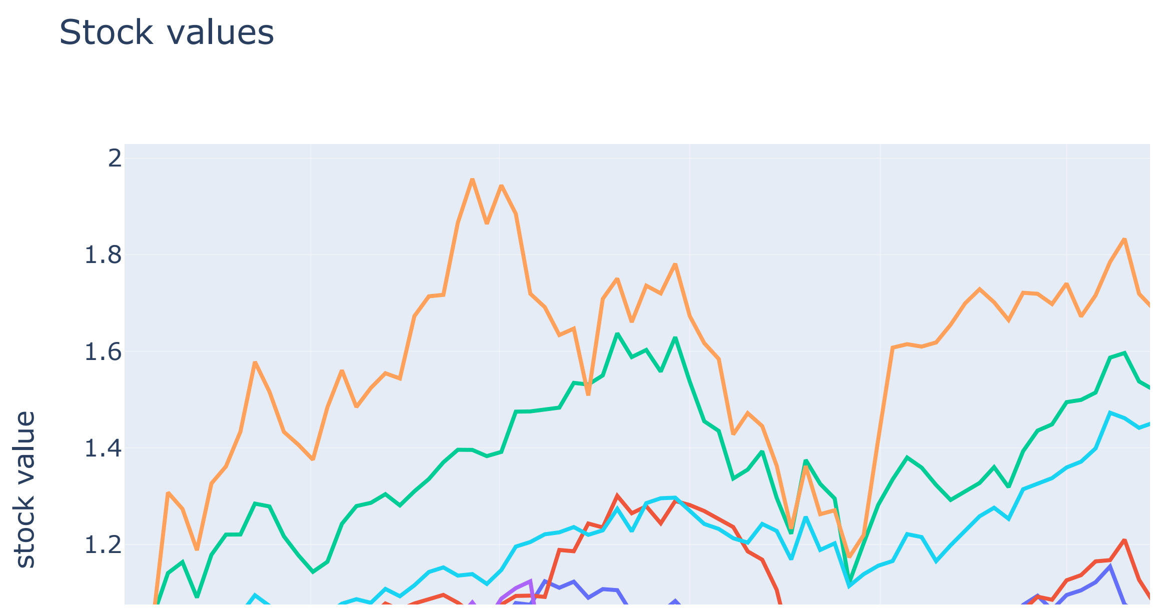
## The stocks dataset

*Hints*:

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

In [9]:

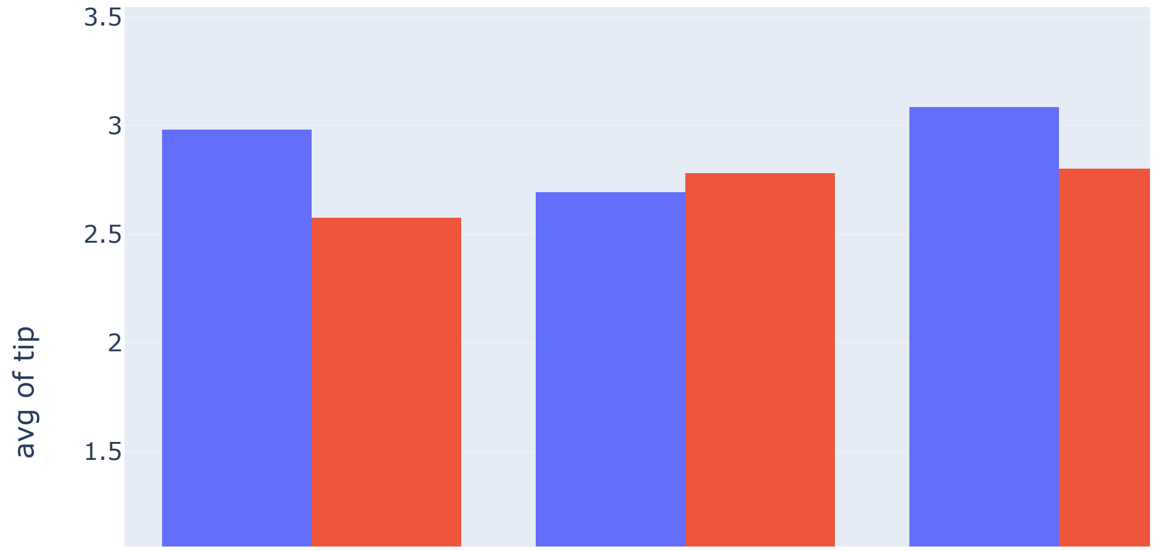
```
stocks = px.data.stocks()
fig = px.line(stocks, x='date', y=stocks.columns[1:], title='Stock values')
fig.update_layout(yaxis_title = 'stock value', legend_title = '')
fig.show()
```



## The tips dataset

In [10]:

```
tips = px.data.tips()
fig = px.histogram(tips, x = 'day', y = 'tip',
            color='sex', barmode='group',
            histfunc='avg', category_orders={'day': ['Thur', 'Fri', 'Sat', 'Sun'], 'sex' : ['Male', 'Female']})
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)
- 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/)
- Add text to each bar that represents the population

In [11]:

```
#load data
df = px.data.gapminder()
df.head()
```

Out[11]:

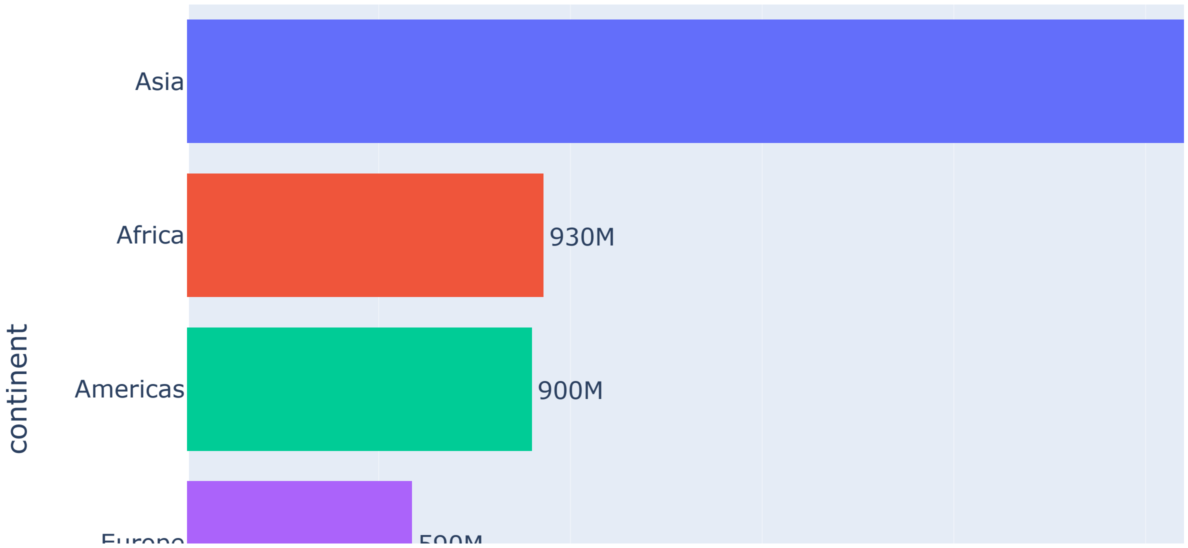
```
       country  continent  year  lifeExp       pop   gdpPercap  iso_alpha  iso_num
0  Afghanistan       Asia  1952   28.801   8425333  779.445314        AFG        4
1  Afghanistan       Asia  1957   30.332   9240934  820.853030        AFG        4
2  Afghanistan       Asia  1962   31.997  10267083  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 [12]:

```
df = df.drop(df[df['year'] != 2007].index)
```

In [13]:

```
fig = px.histogram(df,
                   x = 'pop',
                   y = 'continent',
                   color = 'continent',
                   category_orders={"continent": ["Asia", "Africa", "Americas", "Europe", "Oceania"]},
                   text_auto = '.2s'
                  )
fig.update_traces(textposition = 'outside')
fig.update_layout(xaxis_title = 'pop', showlegend = False)
fig.show()
```



In [ ]: