

```
In [13]: # https://www.machinelearningplus.com/python/101-pandas-exercises-python/
```

```
In [3]: %pip install pandas
%pip install jupyter_contrib_nbextensions

import pandas as pd

url = 'https://raw.githubusercontent.com/edlich/eternalrepo/master/DS-WAHLFACH/countries.csv'
df = pd.read_csv(url)
df
```

```
Requirement already satisfied: pandas in /home/guido/anaconda3/lib/python3.8/site-packages (1.1.3)
Requirement already satisfied: python-dateutil>=2.7.3 in /home/guido/anaconda3/lib/python3.8/site-packages (from pandas) (2.8.1)
Requirement already satisfied: pytz>=2017.2 in /home/guido/anaconda3/lib/python3.8/site-packages (from pandas) (2020.1)
Requirement already satisfied: numpy>=1.15.4 in /home/guido/anaconda3/lib/python3.8/site-packages (from pandas) (1.19.2)
Requirement already satisfied: six>=1.5 in /home/guido/anaconda3/lib/python3.8/site-packages (from python-dateutil>=2.7.3->pandas) (1.15.0)
Note: you may need to restart the kernel to use updated packages.
Requirement already satisfied: jupyter_contrib_nbextensions in /home/guido/anaconda3/lib/python3.8/site-packages (0.5.1)
Requirement already satisfied: nbconvert>=4.2 in /home/guido/anaconda3/lib/python3.8/site-packages (from jupyter_contrib_nbextensions) (6.0.7)
Requirement already satisfied: jupyter-latex-envs>=1.3.8 in /home/guido/anaconda3/lib/python3.8/site-packages (from jupyter_contrib_nbextensions) (1.4.6)
Requirement already satisfied: jupyter-nbextensions-configurator>=0.4.0 in /home/guido/anaconda3/lib/python3.8/site-packages (from jupyter_contrib_nbextensions) (0.4.1)
Requirement already satisfied: lxml in /home/guido/anaconda3/lib/python3.8/site-packages (from jupyter_contrib_nbextensions) (4.6.1)
Requirement already satisfied: notebook>=4.0 in /home/guido/anaconda3/lib/python3.8/site-packages (from jupyter_contrib_nbextensions) (6.1.4)
Requirement already satisfied: jupyter-contrib-core>=0.3.3 in /home/guido/anaconda3/lib/python3.8/site-packages (from jupyter_contrib_nbextensions) (0.3.3)
Requirement already satisfied: jupyter-highlight-selected-word>=0.1.1 in /home/guido/anaconda3/lib/python3.8/site-packages (from jupyter_contrib_nbextensions) (0.2.0)
Requirement already satisfied: traitlets>=4.1 in /home/guido/anaconda3/lib/python3.8/site-packages (from jupyter_contrib_nbextensions) (5.0.5)
Requirement already satisfied: jupyter-core in /home/guido/anaconda3/lib/python3.8/site-packages (from jupyter_contrib_nbextensions) (4.6.3)
Requirement already satisfied: pyyaml in /home/guido/anaconda3/lib/python3.8/site-packages (from jupyter_contrib_nbextensions) (5.4.1)
```

xtensions) (5.3.1)
Requirement already satisfied: tornado in /home/guido/anaconda3/lib/python3.8/site-packages (from jupyter_contrib_nbextensions) (6.0.4)
Requirement already satisfied: ipython-genutils in /home/guido/anaconda3/lib/python3.8/site-packages (from jupyter_contrib_nbextensions) (0.2.0)
Requirement already satisfied: setuptools in /home/guido/anaconda3/lib/python3.8/site-packages (from jupyter-contrib-core>=0.3.3->jupyter_contrib_nbextensions) (50.3.1.post20201107)
Requirement already satisfied: ipython in /home/guido/anaconda3/lib/python3.8/site-packages (from jupyter-latex-envs>=1.3.8->jupyter_contrib_nbextensions) (7.19.0)
Requirement already satisfied: pandocfilters>=1.4.1 in /home/guido/anaconda3/lib/python3.8/site-packages (from nbconvert>=4.2->jupyter_contrib_nbextensions) (1.4.3)
Requirement already satisfied: nbformat>=4.4 in /home/guido/anaconda3/lib/python3.8/site-packages (from nbconvert>=4.2->jupyter_contrib_nbextensions) (5.0.8)
Requirement already satisfied: mistune<2,>=0.8.1 in /home/guido/anaconda3/lib/python3.8/site-packages (from nbconvert>=4.2->jupyter_contrib_nbextensions) (0.8.4)
Requirement already satisfied: Jinja2>=2.4 in /home/guido/anaconda3/lib/python3.8/site-packages (from nbconvert>=4.2->jupyter_contrib_nbextensions) (2.11.2)
Requirement already satisfied: defusedxml in /home/guido/anaconda3/lib/python3.8/site-packages (from nbconvert>=4.2->jupyter_contrib_nbextensions) (0.6.0)
Requirement already satisfied: nbclient<0.6.0,>=0.5.0 in /home/guido/anaconda3/lib/python3.8/site-packages (from nbconvert>=4.2->jupyter_contrib_nbextensions) (0.5.1)
Requirement already satisfied: bleach in /home/guido/anaconda3/lib/python3.8/site-packages (from nbconvert>=4.2->jupyter_contrib_nbextensions) (3.2.1)
Requirement already satisfied: pygments>=2.4.1 in /home/guido/anaconda3/lib/python3.8/site-packages (from nbconvert>=4.2->jupyter_contrib_nbextensions) (2.7.2)
Requirement already satisfied: jupyterlab-pygments in /home/guido/anaconda3/lib/python3.8/site-packages (from nbconvert>=4.2->jupyter_contrib_nbextensions) (0.1.2)
Requirement already satisfied: testpath in /home/guido/anaconda3/lib/python3.8/site-packages (from nbconvert>=4.2->jupyter_contrib_nbextensions) (0.4.4)
Requirement already satisfied: entrypoints>=0.2.2 in /home/guido/anaconda3/lib/python3.8/site-packages (from nbconvert>=4.2->jupyter_contrib_nbextensions) (0.3)
Requirement already satisfied: MarkupSafe>=0.23 in /home/guido/anaconda3/lib/python3.8/site-packages (from Jinja2>=2.4->nbconvert>=4.2->jupyter_contrib_nbextensions) (1.1.1)
Requirement already satisfied: jupyter-client>=6.1.5 in /home/guido/anaconda3/lib/python3.8/site-packages (from nbclient<0.6.0,>=0.5.0->nbconvert>=4.2->jupyter_contrib_nbextensions) (6.1.7)
Requirement already satisfied: async-generator in /home/guido/anaconda3/lib/python3.8/site-packages (from nbclient<0.6.0,>=0.5.0->nbconvert>=4.2->jupyter_contrib_nbextensions) (1.10)
Requirement already satisfied: nest-asyncio in /home/guido/anaconda3/lib/python3.8/site-packages (from nbclient<0.6.0,>=0.5.0->nbconvert>=4.2->jupyter_contrib_nbextensions) (1.4.2)
Requirement already satisfied: pyzmq>=13 in /home/guido/anaconda3/lib/python3.8/site-packages (from jupyter-client>=6.1.5->nbclient<0.6.0,>=0.5.0->nbconvert>=4.2->jupyter_contrib_nbextensions) (19.0.2)
Requirement already satisfied: python-dateutil>=2.1 in /home/guido/anaconda3/lib/python3.8/site-packages (from jupyter-client>=6.1.5->nbclient<0.6.0,>=0.5.0->nbconvert>=4.2->jupyter_contrib_nbextensions) (2.8.1)

Requirement already satisfied: jsonschema!=2.5.0,>=2.4 in /home/guido/anaconda3/lib/python3.8/site-packages (from nbformat>=4.4->nbconvert>=4.2->jupyter_contrib_nbextensions) (3.2.0)

Requirement already satisfied: pyrsistent>=0.14.0 in /home/guido/anaconda3/lib/python3.8/site-packages (from jsonschema!=2.5.0,>=2.4->nbformat>=4.4->nbconvert>=4.2->jupyter_contrib_nbextensions) (0.17.3)

Requirement already satisfied: six>=1.11.0 in /home/guido/anaconda3/lib/python3.8/site-packages (from jsonschema!=2.5.0,>=2.4->nbformat>=4.4->nbconvert>=4.2->jupyter_contrib_nbextensions) (1.15.0)

Requirement already satisfied: attrs>=17.4.0 in /home/guido/anaconda3/lib/python3.8/site-packages (from jsonschema!=2.5.0,>=2.4->nbformat>=4.4->nbconvert>=4.2->jupyter_contrib_nbextensions) (20.3.0)

Requirement already satisfied: prometheus-client in /home/guido/anaconda3/lib/python3.8/site-packages (from notebook>=4.0->jupyter_contrib_nbextensions) (0.8.0)

Requirement already satisfied: terminado>=0.8.3 in /home/guido/anaconda3/lib/python3.8/site-packages (from notebook>=4.0->jupyter_contrib_nbextensions) (0.9.1)

Requirement already satisfied: ipykernel in /home/guido/anaconda3/lib/python3.8/site-packages (from notebook>=4.0->jupyter_contrib_nbextensions) (5.3.4)

Requirement already satisfied: argon2-cffi in /home/guido/anaconda3/lib/python3.8/site-packages (from notebook>=4.0->jupyter_contrib_nbextensions) (20.1.0)

Requirement already satisfied: Send2Trash in /home/guido/anaconda3/lib/python3.8/site-packages (from notebook>=4.0->jupyter_contrib_nbextensions) (1.5.0)

Requirement already satisfied: ptyprocess in /home/guido/anaconda3/lib/python3.8/site-packages (from terminado>=0.8.3->notebook>=4.0->jupyter_contrib_nbextensions) (0.6.0)

Requirement already satisfied: cffi>=1.0.0 in /home/guido/anaconda3/lib/python3.8/site-packages (from argon2-cffi->notebook>=4.0->jupyter_contrib_nbextensions) (1.14.3)

Requirement already satisfied: pycparser in /home/guido/anaconda3/lib/python3.8/site-packages (from cffi>=1.0.0->argon2-cffi->notebook>=4.0->jupyter_contrib_nbextensions) (2.20)

Requirement already satisfied: packaging in /home/guido/anaconda3/lib/python3.8/site-packages (from bleach->nbconvert>=4.2->jupyter_contrib_nbextensions) (20.4)

Requirement already satisfied: webencodings in /home/guido/anaconda3/lib/python3.8/site-packages (from bleach->nbconvert>=4.2->jupyter_contrib_nbextensions) (0.5.1)

Requirement already satisfied: prompt-toolkit!=3.0.0,!<3.0.1,<3.1.0,>=2.0.0 in /home/guido/anaconda3/lib/python3.8/site-packages (from ipython->jupyter-latex-envs>=1.3.8->jupyter_contrib_nbextensions) (3.0.8)

Requirement already satisfied: pexpect>4.3 in /home/guido/anaconda3/lib/python3.8/site-packages (from ipython->jupyter-latex-envs>=1.3.8->jupyter_contrib_nbextensions) (4.8.0)

Requirement already satisfied: backcall in /home/guido/anaconda3/lib/python3.8/site-packages (from ipython->jupyter-latex-envs>=1.3.8->jupyter_contrib_nbextensions) (0.2.0)

Requirement already satisfied: decorator in /home/guido/anaconda3/lib/python3.8/site-packages (from ipython->jupyter-latex-envs>=1.3.8->jupyter_contrib_nbextensions) (4.4.2)

Requirement already satisfied: pickleshare in /home/guido/anaconda3/lib/python3.8/site-packages (from ipython->jupyter-latex-envs>=1.3.8->jupyter_contrib_nbextensions) (0.7.5)

Requirement already satisfied: jedi>=0.10 in /home/guido/anaconda3/lib/python3.8/site-packages (from ipython->jupyter-latex-envs>=1.3.8->jupyter_contrib_nbextensions) (0.17.1)

Requirement already satisfied: parso<0.8.0,>=0.7.0 in /home/guido/anaconda3/lib/python3.8/site-packages (from jedi>=0.10->ipython->jupyter-latex-envs>=1.3.8->jupyter_contrib_nbextensions) (0.7.0)

Requirement already satisfied: wcwidth in /home/guido/anaconda3/lib/python3.8/site-packages (from prompt-toolkit!=3.

```
0.0, !=3.0.1, <3.1.0, >=2.0.0->ipython->jupyter-latex-envs>=1.3.8->jupyter_contrib_nbextensions) (0.2.5)
Requirement already satisfied: pyparsing>=2.0.2 in /home/guido/anaconda3/lib/python3.8/site-packages (from packaging
->bleach->nbconvert>=4.2->jupyter-contrib-nbextensions) (2.4.7)
```

```
Out[3]:
```

	Name	People	Area	BIP	Currency
0	Germany	82521653	357385	3466	EUR
1	Japan	126045000	377835	4938	YEN
2	Canada	36503097	9984670	1529	CAD
3	Italy	60501718	301338	1850	EUR
4	Brazilia	208360000	8515770	1798	REAL

```
In [4]: df.info
```

```
Out[4]: <bound method DataFrame.info of
0    Germany    82521653    357385    3466    EUR
1     Japan    126045000    377835    4938    YEN
2    Canada    36503097    9984670    1529    CAD
3     Italy    60501718    301338    1850    EUR
4  Brazilia    208360000    8515770    1798    REAL>
```

```
In [5]: df.shape
```

```
Out[5]: (5, 5)
```

```
In [6]: df.columns
```

```
Out[6]: Index(['Name', 'People', 'Area', 'BIP', 'Currency'], dtype='object')
```

```
In [7]: df.index
```

```
Out[7]: RangeIndex(start=0, stop=5, step=1)
```

```
In [8]: df.count()
```

```
Out[8]: Name          5
        People        5
        Area          5
        BIP           5
```

Currency 5

In [9]: `df.describe()`

Out[9]:

	People	Area	BIP
count	5.000000e+00	5.000000e+00	5.00000
mean	1.027863e+08	3.907400e+06	2716.20000
std	6.759970e+07	4.904957e+06	1457.86083
min	3.650310e+07	3.013380e+05	1529.00000
25%	6.050172e+07	3.573850e+05	1798.00000
50%	8.252165e+07	3.778350e+05	1850.00000
75%	1.260450e+08	8.515770e+06	3466.00000
max	2.083600e+08	9.984670e+06	4938.00000

In [59]: `df.tail(4)`

Out[59]:

	Name	People	Area	BIP	Currency
1	Japan	126045000	377835	4938	YEN
2	Canada	36503097	9984670	1529	CAD
3	Italy	60501718	301338	1850	EUR
4	Brazilia	208360000	8515770	1798	REAL

In [10]: `df.loc[df['Currency'] == 'EUR']`

Out[10]:

	Name	People	Area	BIP	Currency
0	Germany	82521653	357385	3466	EUR
3	Italy	60501718	301338	1850	EUR

```
In [61]: df_name_cur = df['Name'] + df['Currency']  
df_name_cur  
df_name_cru2 = df.drop(['People', 'Area', 'BIP'], axis=1)  
df_name_cru2
```

```
Out[61]:
```

	Name	Currency
0	Germany	EUR
1	Japan	YEN
2	Canada	CAD
3	Italy	EUR
4	Brazilia	REAL

```
In [11]: df.loc[df['BIP'] > 2000]
```

```
Out[11]:
```

	Name	People	Area	BIP	Currency
0	Germany	82521653	357385	3466	EUR
1	Japan	126045000	377835	4938	YEN

```
In [12]: df[(df['People'] > 50000000) & (df['People'] < 150000000)]
```

```
Out[12]:
```

	Name	People	Area	BIP	Currency
0	Germany	82521653	357385	3466	EUR
1	Japan	126045000	377835	4938	YEN
3	Italy	60501718	301338	1850	EUR

```
In [13]: df
```

```
Out[13]:
```

	Name	People	Area	BIP	Currency
0	Germany	82521653	357385	3466	EUR
1	Japan	126045000	377835	4938	YEN

	Name	People	Area	BIP	Currency
2	Canada	36503097	9984670	1529	CAD
3	Italy	60501718	301338	1850	EUR

```
In [15]: df = df.rename(columns={'BIP': 'Bip'})
df
```

	Name	People	Area	Bip	Currency
0	Germany	82521653	357385	3466	EUR
1	Japan	126045000	377835	4938	YEN
2	Canada	36503097	9984670	1529	CAD
3	Italy	60501718	301338	1850	EUR
4	Brazilia	208360000	8515770	1798	REAL

```
In [16]: Summe_Bip = df['Bip'].sum()
Summe_Bip
```

```
Out[16]: 13581
```

```
In [17]: df['People'].mean()
```

```
Out[17]: 102786293.6
```

```
In [18]: df['People'].sum()/5
```

```
Out[18]: 102786293.6
```

```
In [19]: df.sort_values('Name')
```

	Name	People	Area	Bip	Currency
4	Brazilia	208360000	8515770	1798	REAL
2	Canada	36503097	9984670	1529	CAD
0	Germany	82521653	357385	3466	EUR

	Name	People	Area	Bip	Currency
3	Italy	60501718	301338	1850	EUR

```
In [ ]: import numpy as np
```

```
In [25]: df_copy = df
df_copy['Area'] = np.select([df['Area'] > 1000000, df['Area'] <= 1000000], ['BIG', 'SMALL'], default='No Change')
```

```
In [26]: df_copy
```

```
Out[26]:
```

	Name	People	Area	Bip	Currency
0	Germany	82521653	SMALL	3466	EUR
1	Japan	126045000	SMALL	4938	YEN
2	Canada	36503097	BIG	1529	CAD
3	Italy	60501718	SMALL	1850	EUR
4	Brazilia	208360000	BIG	1798	REAL

```
In [27]: df
```

```
Out[27]:
```

	Name	People	Area	Bip	Currency
0	Germany	82521653	SMALL	3466	EUR
1	Japan	126045000	SMALL	4938	YEN
2	Canada	36503097	BIG	1529	CAD
3	Italy	60501718	SMALL	1850	EUR
4	Brazilia	208360000	BIG	1798	REAL

```
In [ ]:
```