

Assignment-2

1. Numpy: Using NumPy create random vector of size 15 having only Integers in the range 1-20. 1. Reshape the array to 3 by 5 2. Print array shape. 3. Replace the max in each row by 0

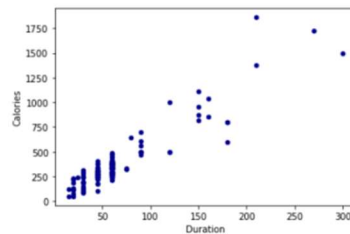
```
In [1]: import numpy as np
x = np.random.randint(1,20,15)
print("Original array:")
print(x)
x[x.argmax()] = 0
print("Maximum value replaced by 0:")
print(x)
```

Original array:
[3 13 19 8 6 13 17 8 4 13 7 9 11 8 11]
Maximum value replaced by 0:
[3 13 0 8 6 13 17 8 4 13 7 9 11 8 11]

2.

2. Pandas

1. Read the provided CSV file 'data.csv'.
<https://drive.google.com/drive/folders/1h8C3mLsso-R-sIOLsvoYwPLzy2fJ4IOF?usp=sharing>
2. Show the basic statistical description about the data.
3. Check if the data has null values.
 - a. Replace the null values with the mean
4. Select at least two columns and aggregate the data using: min, max, count, mean.
5. Filter the dataframe to select the rows with calories values between 500 and 1000.
6. Filter the dataframe to select the rows with calories values > 500 and pulse < 100.
7. Create a new "df_modified" dataframe that contains all the columns from df except for "Maxpulse".
8. Delete the "Maxpulse" column from the main df dataframe
9. Convert the datatype of Calories column to int datatype.
10. Using pandas create a scatter plot for the two columns (Duration and Calories).
 - a. Example:



1.

```
In [5]: import pandas as pd

data = pd.read_csv(r"C:\Users\saipr\anaconda3\data.csv")
data.head()
```

```
Out[5]:
```

	Duration	Pulse	Maxpulse	Calories
0	60	110	130	409.1
1	60	117	145	479.0
2	60	103	135	340.0
3	45	109	175	282.4
4	45	117	148	406.0

2.

```
In [6]: data.describe()
```

```
Out[6]:
```

	Duration	Pulse	Maxpulse	Calories
count	169.000000	169.000000	169.000000	164.000000
mean	63.846154	107.461538	134.047337	375.790244
std	42.299949	14.510259	16.450434	266.379919
min	15.000000	80.000000	100.000000	50.300000
25%	45.000000	100.000000	124.000000	250.925000
50%	60.000000	105.000000	131.000000	318.600000
75%	60.000000	111.000000	141.000000	387.600000
max	300.000000	159.000000	184.000000	1860.400000

3,4

```
In [7]: data.isnull().any()
```

```
Out[7]: Duration    False
Pulse            False
Maxpulse         False
Calories         True
dtype: bool
```

```
In [8]: data.fillna(data.mean(), inplace=True)
data.isnull().any()
```

```
Out[8]: Duration    False
Pulse            False
Maxpulse         False
Calories         False
dtype: bool
```

```
In [9]: data.agg({'Duration': ['min', 'max', 'count', 'mean'], 'Pulse': ['min', 'max', 'count', 'mean']})
```

```
Out[9]:
```

	Duration	Pulse
min	15.000000	80.000000
max	300.000000	159.000000
count	169.000000	169.000000
mean	63.846154	107.461538

5

```
In [10]: data.loc[(data['Calories']>500)&(data['Calories']<1000)]
```

```
Out[10]:
```

	Duration	Pulse	Maxpulse	Calories
51	80	123	146	643.1
62	160	109	135	853.0
65	180	90	130	800.4
66	150	105	135	873.4
67	150	107	130	816.0
72	90	100	127	700.0
73	150	97	127	953.2
75	90	98	125	563.2
78	120	100	130	500.4
90	180	101	127	600.1
99	90	93	124	604.1
103	90	90	100	500.4
106	180	90	120	800.3
108	90	90	120	500.3

6,7

```
In [11]: data.loc[(data['Calories']>500)&(data['Pulse']<100)]
```

```
Out[11]:
```

	Duration	Pulse	Maxpulse	Calories
65	180	90	130	800.4
70	150	97	129	1115.0
73	150	97	127	953.2
75	90	98	125	563.2
99	90	93	124	604.1
103	90	90	100	500.4
106	180	90	120	800.3
108	90	90	120	500.3

```
In [12]: df_modified = data[['Duration','Pulse','Calories']]
df_modified.head()
```

```
Out[12]:
```

	Duration	Pulse	Calories
0	60	110	409.1
1	60	117	479.0
2	60	103	340.0
3	45	109	282.4
4	45	117	406.0

8,9

```
In [13]: del data['Maxpulse']
data.head()
```

```
Out[13]:
```

	Duration	Pulse	Calories
0	60	110	409.1
1	60	117	479.0
2	60	103	340.0
3	45	109	282.4
4	45	117	406.0

```
In [14]: data.dtypes
```

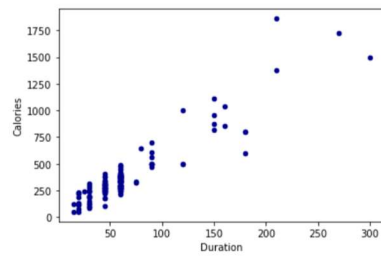
```
Out[14]: Duration      int64
Pulse              int64
Calories    float64
dtype: object
```

```
In [15]: data['Calories'] = data['Calories'].astype(np.int64)
data.dtypes
```

```
Out[15]: Duration      int64
Pulse              int64
Calories    int64
dtype: object
```

10

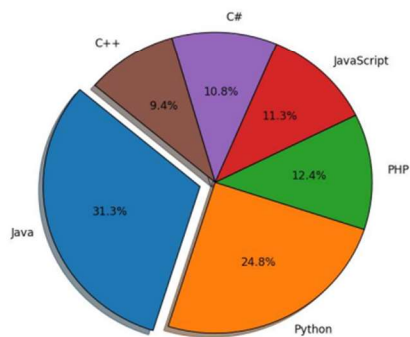
```
In [16]: data.plot.scatter(x='Duration',y='Calories',c='DarkBlue')
Out[16]: <AxesSubplot: xlabel='Duration', ylabel='Calories'>
```



3

3. Matplotlib

1. Write a Python programming to create a below chart of the popularity of programming Languages.
2. Sample data:
 Programming languages: Java, Python, PHP, JavaScript, C#, C++
 Popularity: 22.2, 17.6, 8.8, 8, 7.7, 6.7



```
In [17]: import matplotlib.pyplot as plt
# Data to plot
languages = 'Java', 'Python', 'PHP', 'JavaScript', 'C#', 'C++'
popularity = [22.2, 17.6, 8.8, 8, 7.7, 6.7]
colors = ["#1f77b4", "#ff7f0e", "#2ca02c", "#d62728", "#9467bd", "#8c564b"]
# explode 1st slice
explode = (0.1, 0, 0, 0, 0, 0)
# Plot
plt.pie(popularity, explode=explode, labels=languages, colors=colors,
autopct='%1.1f%%', shadow=True, startangle=140)

plt.axis('equal')
plt.show()
```

