In [2]:
```python
import pandas as pd
import os
```

In [3]:
```python
import numpy as np
```

In [4]:
```python
os.chdir('D:\DataScience')
```

In [5]:
```python
pwd
```

Out[5]: 'D:\\DataScience'

In [13]:
```python
#3. Print the scores.
scores=pd.read_excel('Score.xlsx')
print(scores)
```

```
                        Name  English  Mathematics
0           Muhammad Abubakr       93           90
1                Yamna Tahir       90           45
2                Waqar - FTI       40           80
3         Khoulah Afzal Qamar       93           76
4              Ali Ibad Brohi       43           56
5              Maad Saifuddin       80           59
6               Hassan Ahmed       71           30
7           Hamza Quaid Joher       90           89
8            M. Umair Munshi       73           90
9                 Rama Abrik       93           87
10               Qaisar Nisar       78           45
11  Muhammad Sami Ullah Khan       40           60
12      Hafiz Muhammad Shahid       47           90
13       Syed Ahmed Ali Naqvi       23           40
14               Daniyal Khan       45           70
15        Hussain Murtaza Ali       76           39
16               Uzair Irshad       86           88
17                Noman-Ul-Haq       42           78
18       Muhammad Usama Ovais       38           60
19                   Moiz Ali       90           87
```

In [14]:
```python
#4. Set the name column as the index.
scores.set_index('Name', inplace = True)
print(scores)
```

```
                          English  Mathematics
Name
Muhammad Abubakr               93           90
Yamna Tahir                    90           45
Waqar - FTI                    40           80
Khoulah Afzal Qamar            93           76
Ali Ibad Brohi                 43           56
Maad Saifuddin                 80           59
Hassan Ahmed                   71           30
Hamza Quaid Joher              90           89
M. Umair Munshi                73           90
Rama Abrik                     93           87
Qaisar Nisar                   78           45
Muhammad Sami Ullah Khan       40           60
Hafiz Muhammad Shahid          47           90
Syed Ahmed Ali Naqvi           23           40
Daniyal Khan                   45           70
Hussain Murtaza Ali            76           39
Uzair Irshad                   86           88
Noman-Ul-Haq                   42           78
Muhammad Usama Ovais           38           60
Moiz Ali                       90           87
```

In [15]:
```python
#5. Convert the loaded data into a numpy array.
np_scores=np.array(scores)
np_scores
```

Out[15]:
```
array([[93, 90],
       [90, 45],
       [40, 80],
       [93, 76],
       [43, 56],
       [80, 59],
       [71, 30],
       [90, 89],
       [73, 90],
       [93, 87],
       [78, 45],
       [40, 60],
       [47, 90],
       [23, 40],
       [45, 70],
       [76, 39],
       [86, 88],
       [42, 78],
       [38, 60],
       [90, 87]], dtype=int64)
```

In [16]:
```python
#6. Report the maximum score in English.
print('The maximum score in English is',max(np_scores[0:,0]))
```

```
The maximum score in English is 93
```

In [17]:
```python
#7. Report the minimum score English.
print('The minimum score in English is',min(np_scores[0:,0]))
```

```
The minimum score in English is 23
```

In [18]:
```python
#8. Report the maximum score in Mathematics.
print('The maximum score in mathematics is',max(np_scores[0:,1]))
```

```
The maximum score in mathematics is 90
```

In [19]:
```python
#9. Report the minimum score in Mathematics.
print('The minimum score in mathematics is',min(np_scores[0:,1]))
```

```
The minimum score in mathematics is 30
```

In [20]:
```python
#10. Sort the list by English scores.
eng_scores=np_scores[0:,0]
math_scores=np_scores[0:,1]
eng_sort=np.concatenate(([eng_scores[np.argsort(eng_scores)]],[math_scores[np
print(eng_sort)
```

```
[[23 38 40 40 42 43 45 47 71 73 76 78 80 86 90 90 90 93 93 93]
 [40 60 80 60 78 56 70 90 30 90 39 45 59 88 45 89 87 90 76 87]]
```

In [21]:
```python
#11. Sort the list by Mathematics scores.
math_sort=np.concatenate(([eng_scores[np.argsort(math_scores)]],[math_scores[
print(math_sort)
```

```
[[71 76 23 90 78 43 80 38 40 45 93 42 40 93 90 86 90 73 47 93]
 [30 39 40 45 45 56 59 60 60 70 76 78 80 87 87 88 89 90 90 90]]
```

In [22]:
```python
#12. Find the mean score of each subject.
print('The mean score of English subject is {} and the mean score of Mathemat
```

```
The mean score of English subject is 66.55 and the mean score of Mathematics
subject is 67.95
```

In [32]:
```python
#13. Filter the English scores that are greater than 90.
print('The English scores that are greater than 90 are {}' .format(eng_scores
```

```
The English scores that are greater than 90 are [93 93 93]
```

In [34]:
```python
#14.Filter the Mathematics scores that are below 50.
print('The Mathematics scores that are below 50 are {}' .format(math_scores[m
```

```
The Mathematics scores that are below 50 are [45 30 45 40 39]
```

In [45]:
```python
#15. Find the correlation between the two subjects.
corr=np.corrcoef(eng_scores,math_scores)[1,0]
print('The correlation between the two subjects is' ,corr)
```

The correlation between the two subjects is 0.25186154896344287

In [61]:
```python
#16. Add another column to the numpy array with the heading Science and using
sci_marks=np.random.randint(0,100,size=20)
sci_scores=np.concatenate((np.reshape(sci_marks,(20,1)),np.zeros((20,1),dtype
new_scores=np.concatenate((np_scores,sci_scores))
print('The new scores are \n{}' .format(new_scores))
```

```
The new scores are
[[93 90]
 [90 45]
 [40 80]
 [93 76]
 [43 56]
 [80 59]
 [71 30]
 [90 89]
 [73 90]
 [93 87]
 [78 45]
 [40 60]
 [47 90]
 [23 40]
 [45 70]
 [76 39]
 [86 88]
 [42 78]
 [38 60]
 [90 87]
 [72  0]
 [54  0]
 [41  0]
 [68  0]
 [17  0]
 [70  0]
 [16  0]
 [73  0]
 [10  0]
 [52  0]
 [11  0]
 [93  0]
 [80  0]
 [72  0]
 [66  0]
 [97  0]
 [50  0]
 [45  0]
 [32  0]
 [31  0]]
```