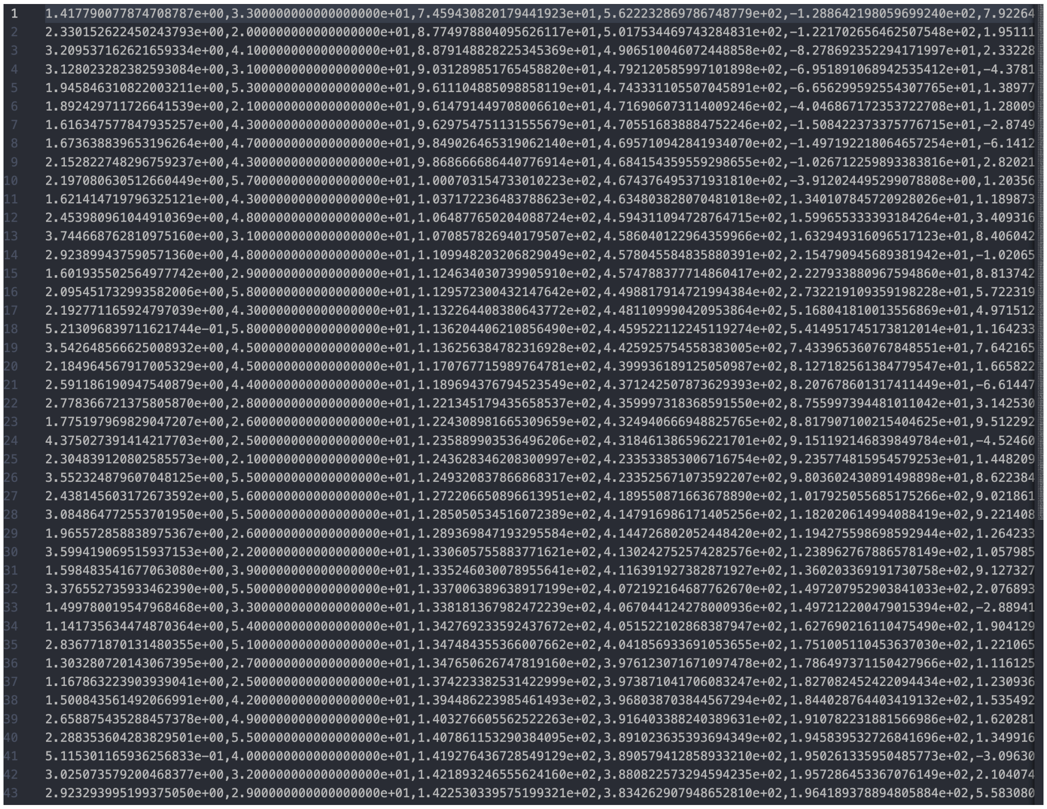
Machine Learning Supervised

Artificial dataset generation



```
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```
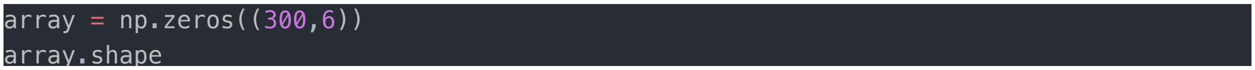

Import necessary modules

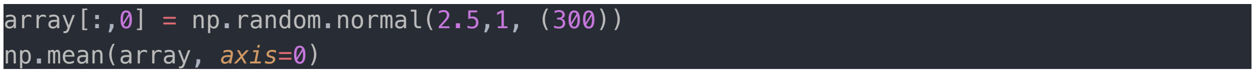
```python
#!/usr/bin/python3

from sys import argv, exit

import numpy as np
```

Create an array containing 0 with 300 datapoints and 6 columns



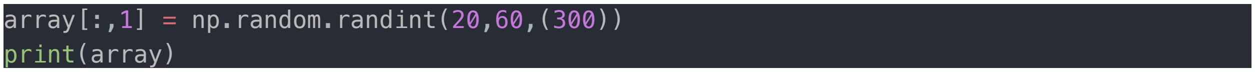
```
array = np.zeros((300,6))
array.shape
```

Change the values in a column to numbers that have a mean of 2.5



```
array[:,0] = np.random.normal(2.5,1, (300))
np.mean(array, axis=0)
```

Change the values of a column by random Integers

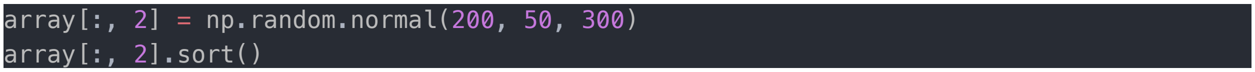


```
array[:,1] = np.random.randint(20,60,(300))
print(array)
```

Result:

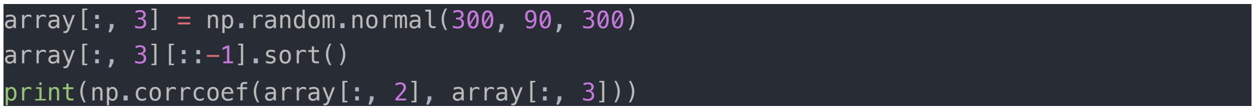
```
[[ 1.41779008 33.        0.        0.        0.        0.      ]
 [ 2.33015262 20.        0.        0.        0.        0.      ]
 [ 3.20953716 41.        0.        0.        0.        0.      ]
 ...
 [ 0.24013131 31.        0.        0.        0.        0.      ]
 [-2.79370555 34.        0.        0.        0.        0.      ]
 [ 1.01028494 32.        0.        0.        0.        0.      ]]
```

Change the values of a column to sorted floats



```
array[:, 2] = np.random.normal(200, 50, 300)
array[:, 2].sort()
```

Create negative correlation

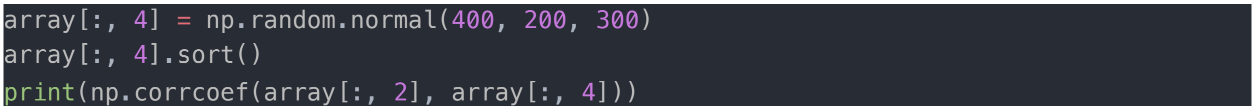


```
array[:, 3] = np.random.normal(300, 90, 300)
array[:, 3][::-1].sort()
print(np.corrcoef(array[:, 2], array[:, 3]))
```

Result:

```
[[ 1.        -0.9930233]

 [-0.9930233  1.       ]]
```

Create positive correlation

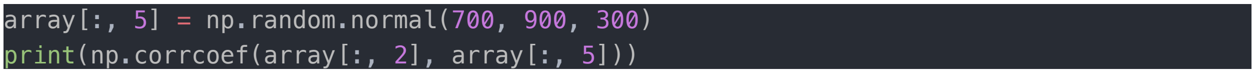


```
array[:, 4] = np.random.normal(400, 200, 300)
array[:, 4].sort()
print(np.corrcoef(array[:, 2], array[:, 4]))
```

Result:

```
[[1.         0.99618073]

 [0.99618073 1.        ]]
```

Create a correlation close to 0



```
array[:, 5] = np.random.normal(700, 900, 300)
print(np.corrcoef(array[:, 2], array[:, 5]))
```

Result:

```
[[1.         0.01673262]

 [0.01673262 1.        ]]
```

Check if the columns all have a different mean

```
np.mean(array, axis=0)
```

Check if the columns all have a different standard deviation

```
array.std(axis=0)
```

Save dataset into a csv file and exit with code 0

```
np.savetxt("artificial_dataset.csv", array, delimiter=",")

exit(0)
```