Machine Learning Project - Assignment 08

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Computing Area

```
# Required libraries
import numpy as np
import matplotlib.pyplot as plt
```

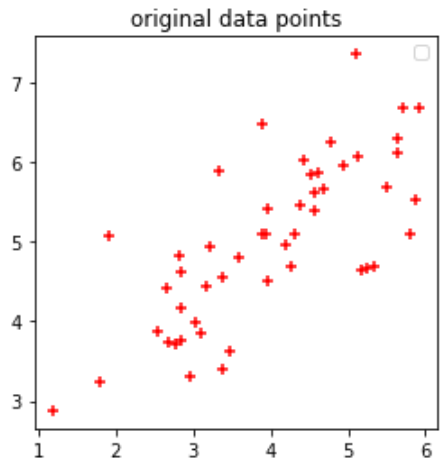
```
# Upload data
data = np.loadtxt('/content/drive/My Drive/Colab Notebooks/MachineLearningProject/08/d
x = data[:,0]
y = data[:,1]
```

```
def normalize_data(x, y):
    xn = (x-np.mean(x)) / np.std(x)
    yn = (y-np.mean(y)) / np.std(y)
    return xn, yn
```

```
def compute_covariance(x, y):
    x_tmp = x.reshape(1, len(x))
    y_tmp = y.reshape(1, len(y))
    z = np.concatenate([x_tmp,y_tmp])
    covar = np.dot(z, z.T) / x.shape[0]
    return covar
```

```
## Example results
plt.figure(figsize=(4,4))
plt.legend()
plt.title('original data points')
plt.scatter(x, y, marker='+', c='r')
```

```
No handles with labels found to put in legend.
<matplotlib.collections.PathCollection at 0x7fb90cfc7748>
```



1

```
1
2 xn, yn = normalize_data(x, y)
```

```
1 ## Example results2
2
3 plt.figure(figsize=(5,5))
4 plt.legend()
5 plt.title('data nomalized by z-scoring')
6 plt.scatter(xn, yn, marker='+', c='r')
```

```
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<matplotlib.collections.PathCollection at 0x7fb90d109c18>
```

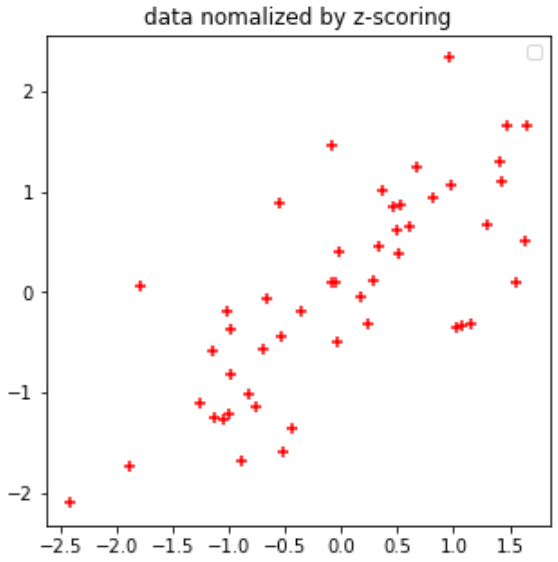


```
1 covar = compute_covariance(x, y)
2 print(covar)
```

```
[[17.26276298 20.82287017]
 [20.82287017 26.05448463]]
```

Result Area

1. Plot the original data points

```
1 plt.figure(figsize=(6,6))
2 plt.legend()
3 plt.title('original data points')
4 plt.scatter(x, y, marker='+', c='r')
```

```
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<matplotlib.collections.PathCollection at 0x7fb90d19ab38>
```

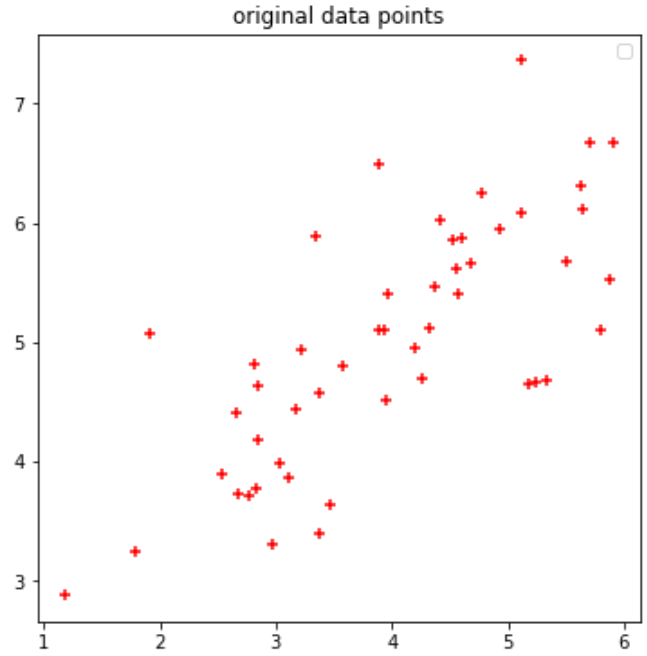

2. Plot the normalized data points

```
1 plt.figure(figsize=(6,6))
2 plt.legend()
3 plt.title('data nomalized by z-scoring')
4 plt.scatter(xn, yn, marker='+', c='r')
```

```
No handles with labels found to put in legend.
<matplotlib.collections.PathCollection at 0x7fb90cf0bf28>
```