In [3]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

In [4]:
```
dataset = pd.read_csv('50_Startups.csv')
dataset.head()
```

Out[4]:

| | R&D Spend | Administration | Marketing Spend | State | Profit |
|---|---|---|---|---|---|
| **0** | 165349.20 | 136897.80 | 471784.10 | New York | 192261.83 |
| **1** | 162597.70 | 151377.59 | 443898.53 | California | 191792.06 |
| **2** | 153441.51 | 101145.55 | 407934.54 | Florida | 191050.39 |
| **3** | 144372.41 | 118671.85 | 383199.62 | New York | 182901.99 |
| **4** | 142107.34 | 91391.77 | 366168.42 | Florida | 166187.94 |

In [5]:
```
x = dataset.iloc[:,:-1].values
x
```

Out[5]:
```
array([[165349.2, 136897.8, 471784.1, 'New York'],
       [162597.7, 151377.59, 443898.53, 'California'],
       [153441.51, 101145.55, 407934.54, 'Florida'],
       [144372.41, 118671.85, 383199.62, 'New York'],
       [142107.34, 91391.77, 366168.42, 'Florida'],
       [131876.9, 99814.71, 362861.36, 'New York'],
       [134615.46, 147198.87, 127716.82, 'California'],
       [130298.13, 145530.06, 323876.68, 'Florida'],
       [120542.52, 148718.95, 311613.29, 'New York'],
       [123334.88, 108679.17, 304981.62, 'California'],
       [101913.08, 110594.11, 229160.95, 'Florida'],
       [100671.96, 91790.61, 249744.55, 'California'],
       [93863.75, 127320.38, 249839.44, 'Florida'],
       [91992.39, 135495.07, 252664.93, 'California'],
       [119943.24, 156547.42, 256512.92, 'Florida'],
       [114523.61, 122616.84, 261776.23, 'New York'],
       [78013.11, 121597.55, 264346.06, 'California'],
       [94657.16, 145077.58, 282574.31, 'New York'],
       [91749.16, 114175.79, 294919.57, 'Florida'],
       [86419.7, 153514.11, 0.0, 'New York'],
       [76253.86, 113867.3, 298664.47, 'California'],
       [78389.47, 153773.43, 299737.29, 'New York'],
       [73994.56, 122782.75, 303319.26, 'Florida'],
       [67532.53, 105751.03, 304768.73, 'Florida'],
       [77044.01, 99281.34, 140574.81, 'New York'],
       [64664.71, 139553.16, 137962.62, 'California'],
       [75328.87, 144135.98, 134050.07, 'Florida'],
       [72107.6, 127864.55, 353183.81, 'New York'],
       [66051.52, 182645.56, 118148.2, 'Florida'],
       [65605.48, 153032.06, 107138.38, 'New York'],
       [61994.48, 115641.28, 91131.24, 'Florida'],
       [61136.38, 152701.92, 88218.23, 'New York'],
       [63408.86, 129219.61, 46085.25, 'California'],
       [55493.95, 103057.49, 214634.81, 'Florida'],
       [46426.07, 157693.92, 210797.67, 'California'],
       [46014.02, 85047.44, 205517.64, 'New York'],
       [28663.76, 127056.21, 201126.82, 'Florida'],
       [44069.95, 51283.14, 197029.42, 'California'],
       [20229.59, 65947.93, 185265.1, 'New York'],
       [38558.51, 82982.09, 174999.3, 'California'],
       [28754.33, 118546.05, 172795.67, 'California'],
       [27892.92, 84710.77, 164470.71, 'Florida'],
       [23640.93, 96189.63, 148001.11, 'California'],
       [15505.73, 127382.3, 35534.17, 'New York'],
       [22177.74, 154806.14, 28334.72, 'California'],
       [1000.23, 124153.04, 1903.93, 'New York'],
       [1315.46, 115816.21, 297114.46, 'Florida'],
       [0.0, 135426.92, 0.0, 'California'],
       [542.05, 51743.15, 0.0, 'New York'],
       [0.0, 116983.8, 45173.06, 'California']], dtype=object)
```

In [6]:
```
y = dataset.iloc[:,4]
y
```

Out[6]:
```
0     192261.83
1     191792.06
2     191050.39
3     182901.99
4     166187.94
5     156991.12
6     156122.51
7     155752.60
8     152211.77
9     149759.96
10    146121.95
11    144259.40
12    141585.52
13    134307.35
14    132602.65
15    129917.04
16    126992.93
17    125370.37
18    124266.90
19    122776.86
20    118474.03
21    111313.02
22    110352.25
23    108733.99
24    108552.04
25    107404.34
26    105733.54
27    105008.31
28    103282.38
29    101004.64
30     99937.59
31     97483.56
32     97427.84
33     96778.92
34     96712.80
35     96479.51
36     90708.19
37     89949.14
38     81229.06
39     81005.76
40     78239.91
41     77798.83
42     71498.49
43     69758.98
44     65200.33
45     64926.08
46     49490.75
47     42559.73
48     35673.41
49     14681.40
Name: Profit, dtype: float64
```

In [7]:
```
#convert txt into numerical values
from sklearn.preprocessing import LabelEncoder , OneHotEncoder
labelencoder_x=LabelEncoder()
#column to be converted
x[:,3] = labelencoder_x.fit_transform(x[:,3])
onehotencoder=OneHotEncoder(categorical_features=[3])
x= onehotencoder.fit_transform(x).toarray()
x
```

```
Out[7]: array([[  0.00000000e+00,   0.00000000e+00,   1.00000000e+00,
                  1.65349200e+05,   1.36897800e+05,   4.71784100e+05],
                [  1.00000000e+00,   0.00000000e+00,   0.00000000e+00,
                  1.62597700e+05,   1.51377590e+05,   4.43898530e+05],
                [  0.00000000e+00,   1.00000000e+00,   0.00000000e+00,
                  1.53441510e+05,   1.01145550e+05,   4.07934540e+05],
                [  0.00000000e+00,   0.00000000e+00,   1.00000000e+00,
                  1.44372410e+05,   1.18671850e+05,   3.83199620e+05],
                [  0.00000000e+00,   1.00000000e+00,   0.00000000e+00,
                  1.42107340e+05,   9.13917700e+04,   3.66168420e+05],
                [  0.00000000e+00,   0.00000000e+00,   1.00000000e+00,
                  1.31876900e+05,   9.98147100e+04,   3.62861360e+05],
                [  1.00000000e+00,   0.00000000e+00,   0.00000000e+00,
                  1.34615460e+05,   1.47198870e+05,   1.27716820e+05],
                [  0.00000000e+00,   1.00000000e+00,   0.00000000e+00,
                  1.30298130e+05,   1.45530060e+05,   3.23876680e+05],
                [  0.00000000e+00,   0.00000000e+00,   1.00000000e+00,
                  1.20542520e+05,   1.48718950e+05,   3.11613290e+05],
                [  1.00000000e+00,   0.00000000e+00,   0.00000000e+00,
                  1.23334880e+05,   1.08679170e+05,   3.04981620e+05],
                [  0.00000000e+00,   1.00000000e+00,   0.00000000e+00,
                  1.01913080e+05,   1.10594110e+05,   2.29160950e+05],
                [  1.00000000e+00,   0.00000000e+00,   0.00000000e+00,
                  1.00671960e+05,   9.17906100e+04,   2.49744550e+05],
                [  0.00000000e+00,   1.00000000e+00,   0.00000000e+00,
                  9.38637500e+04,   1.27320380e+05,   2.49839440e+05],
                [  1.00000000e+00,   0.00000000e+00,   0.00000000e+00,
                  9.19923900e+04,   1.35495070e+05,   2.52664930e+05],
                [  0.00000000e+00,   1.00000000e+00,   0.00000000e+00,
                  1.19943240e+05,   1.56547420e+05,   2.56512920e+05],
                [  0.00000000e+00,   0.00000000e+00,   1.00000000e+00,
                  1.14523610e+05,   1.22616840e+05,   2.61776230e+05],
                [  1.00000000e+00,   0.00000000e+00,   0.00000000e+00,
                  7.80131100e+04,   1.21597550e+05,   2.64346060e+05],
                [  0.00000000e+00,   0.00000000e+00,   1.00000000e+00,
                  9.46571600e+04,   1.45077580e+05,   2.82574310e+05],
                [  0.00000000e+00,   1.00000000e+00,   0.00000000e+00,
                  9.17491600e+04,   1.14175790e+05,   2.94919570e+05],
                [  0.00000000e+00,   0.00000000e+00,   1.00000000e+00,
                  8.64197000e+04,   1.53514110e+05,   0.00000000e+00],
                [  1.00000000e+00,   0.00000000e+00,   0.00000000e+00,
                  7.62538600e+04,   1.13867300e+05,   2.98664470e+05],
                [  0.00000000e+00,   0.00000000e+00,   1.00000000e+00,
                  7.83894700e+04,   1.53773430e+05,   2.99737290e+05],
                [  0.00000000e+00,   1.00000000e+00,   0.00000000e+00,
                  7.39945600e+04,   1.22782750e+05,   3.03319260e+05],
                [  0.00000000e+00,   1.00000000e+00,   0.00000000e+00,
                  6.75325300e+04,   1.05751030e+05,   3.04768730e+05],
                [  0.00000000e+00,   0.00000000e+00,   1.00000000e+00,
                  7.70440100e+04,   9.92813400e+04,   1.40574810e+05],
                [  1.00000000e+00,   0.00000000e+00,   0.00000000e+00,
                  6.46647100e+04,   1.39553160e+05,   1.37962620e+05],
                [  0.00000000e+00,   1.00000000e+00,   0.00000000e+00,
                  7.53288700e+04,   1.44135980e+05,   1.34050070e+05],
                [  0.00000000e+00,   0.00000000e+00,   1.00000000e+00,
                  7.21076000e+04,   1.27864550e+05,   3.53183810e+05],
                [  0.00000000e+00,   1.00000000e+00,   0.00000000e+00,
```

```
   6.60515200e+04,   1.82645560e+05,   1.18148200e+05],
[  0.00000000e+00,   0.00000000e+00,   1.00000000e+00,
   6.56054800e+04,   1.53032060e+05,   1.07138380e+05],
[  0.00000000e+00,   1.00000000e+00,   0.00000000e+00,
   6.19944800e+04,   1.15641280e+05,   9.11312400e+04],
[  0.00000000e+00,   0.00000000e+00,   1.00000000e+00,
   6.11363800e+04,   1.52701920e+05,   8.82182300e+04],
[  1.00000000e+00,   0.00000000e+00,   0.00000000e+00,
   6.34088600e+04,   1.29219610e+05,   4.60852500e+04],
[  0.00000000e+00,   1.00000000e+00,   0.00000000e+00,
   5.54939500e+04,   1.03057490e+05,   2.14634810e+05],
[  1.00000000e+00,   0.00000000e+00,   0.00000000e+00,
   4.64260700e+04,   1.57693920e+05,   2.10797670e+05],
[  0.00000000e+00,   0.00000000e+00,   1.00000000e+00,
   4.60140200e+04,   8.50474400e+04,   2.05517640e+05],
[  0.00000000e+00,   1.00000000e+00,   0.00000000e+00,
   2.86637600e+04,   1.27056210e+05,   2.01126820e+05],
[  1.00000000e+00,   0.00000000e+00,   0.00000000e+00,
   4.40699500e+04,   5.12831400e+04,   1.97029420e+05],
[  0.00000000e+00,   0.00000000e+00,   1.00000000e+00,
   2.02295900e+04,   6.59479300e+04,   1.85265100e+05],
[  1.00000000e+00,   0.00000000e+00,   0.00000000e+00,
   3.85585100e+04,   8.29820900e+04,   1.74999300e+05],
[  1.00000000e+00,   0.00000000e+00,   0.00000000e+00,
   2.87543300e+04,   1.18546050e+05,   1.72795670e+05],
[  0.00000000e+00,   1.00000000e+00,   0.00000000e+00,
   2.78929200e+04,   8.47107700e+04,   1.64470710e+05],
[  1.00000000e+00,   0.00000000e+00,   0.00000000e+00,
   2.36409300e+04,   9.61896300e+04,   1.48001110e+05],
[  0.00000000e+00,   0.00000000e+00,   1.00000000e+00,
   1.55057300e+04,   1.27382300e+05,   3.55341700e+04],
[  1.00000000e+00,   0.00000000e+00,   0.00000000e+00,
   2.21777400e+04,   1.54806140e+05,   2.83347200e+04],
[  0.00000000e+00,   0.00000000e+00,   1.00000000e+00,
   1.00023000e+03,   1.24153040e+05,   1.90393000e+03],
[  0.00000000e+00,   1.00000000e+00,   0.00000000e+00,
   1.31546000e+03,   1.15816210e+05,   2.97114460e+05],
[  1.00000000e+00,   0.00000000e+00,   0.00000000e+00,
   0.00000000e+00,   1.35426920e+05,   0.00000000e+00],
[  0.00000000e+00,   0.00000000e+00,   1.00000000e+00,
   5.42050000e+02,   5.17431500e+04,   0.00000000e+00],
[  1.00000000e+00,   0.00000000e+00,   0.00000000e+00,
   0.00000000e+00,   1.16983800e+05,   4.51730600e+04]])
```

In [8]:
```
#avoid dummy variables
x=x[:,1:]
x
```

```
Out[8]: array([[  0.00000000e+00,   1.00000000e+00,   1.65349200e+05,
                  1.36897800e+05,   4.71784100e+05],
                [  0.00000000e+00,   0.00000000e+00,   1.62597700e+05,
                  1.51377590e+05,   4.43898530e+05],
                [  1.00000000e+00,   0.00000000e+00,   1.53441510e+05,
                  1.01145550e+05,   4.07934540e+05],
                [  0.00000000e+00,   1.00000000e+00,   1.44372410e+05,
                  1.18671850e+05,   3.83199620e+05],
                [  1.00000000e+00,   0.00000000e+00,   1.42107340e+05,
                  9.13917700e+04,   3.66168420e+05],
                [  0.00000000e+00,   1.00000000e+00,   1.31876900e+05,
                  9.98147100e+04,   3.62861360e+05],
                [  0.00000000e+00,   0.00000000e+00,   1.34615460e+05,
                  1.47198870e+05,   1.27716820e+05],
                [  1.00000000e+00,   0.00000000e+00,   1.30298130e+05,
                  1.45530060e+05,   3.23876680e+05],
                [  0.00000000e+00,   1.00000000e+00,   1.20542520e+05,
                  1.48718950e+05,   3.11613290e+05],
                [  0.00000000e+00,   0.00000000e+00,   1.23334880e+05,
                  1.08679170e+05,   3.04981620e+05],
                [  1.00000000e+00,   0.00000000e+00,   1.01913080e+05,
                  1.10594110e+05,   2.29160950e+05],
                [  0.00000000e+00,   0.00000000e+00,   1.00671960e+05,
                  9.17906100e+04,   2.49744550e+05],
                [  1.00000000e+00,   0.00000000e+00,   9.38637500e+04,
                  1.27320380e+05,   2.49839440e+05],
                [  0.00000000e+00,   0.00000000e+00,   9.19923900e+04,
                  1.35495070e+05,   2.52664930e+05],
                [  1.00000000e+00,   0.00000000e+00,   1.19943240e+05,
                  1.56547420e+05,   2.56512920e+05],
                [  0.00000000e+00,   1.00000000e+00,   1.14523610e+05,
                  1.22616840e+05,   2.61776230e+05],
                [  0.00000000e+00,   0.00000000e+00,   7.80131100e+04,
                  1.21597550e+05,   2.64346060e+05],
                [  0.00000000e+00,   1.00000000e+00,   9.46571600e+04,
                  1.45077580e+05,   2.82574310e+05],
                [  1.00000000e+00,   0.00000000e+00,   9.17491600e+04,
                  1.14175790e+05,   2.94919570e+05],
                [  0.00000000e+00,   1.00000000e+00,   8.64197000e+04,
                  1.53514110e+05,   0.00000000e+00],
                [  0.00000000e+00,   0.00000000e+00,   7.62538600e+04,
                  1.13867300e+05,   2.98664470e+05],
                [  0.00000000e+00,   1.00000000e+00,   7.83894700e+04,
                  1.53773430e+05,   2.99737290e+05],
                [  1.00000000e+00,   0.00000000e+00,   7.39945600e+04,
                  1.22782750e+05,   3.03319260e+05],
                [  1.00000000e+00,   0.00000000e+00,   6.75325300e+04,
                  1.05751030e+05,   3.04768730e+05],
                [  0.00000000e+00,   1.00000000e+00,   7.70440100e+04,
                  9.92813400e+04,   1.40574810e+05],
                [  0.00000000e+00,   0.00000000e+00,   6.46647100e+04,
                  1.39553160e+05,   1.37962620e+05],
                [  1.00000000e+00,   0.00000000e+00,   7.53288700e+04,
                  1.44135980e+05,   1.34050070e+05],
                [  0.00000000e+00,   1.00000000e+00,   7.21076000e+04,
                  1.27864550e+05,   3.53183810e+05],
                [  1.00000000e+00,   0.00000000e+00,   6.60515200e+04,
```

```
   1.82645560e+05,   1.18148200e+05],
[  0.00000000e+00,   1.00000000e+00,   6.56054800e+04,
   1.53032060e+05,   1.07138380e+05],
[  1.00000000e+00,   0.00000000e+00,   6.19944800e+04,
   1.15641280e+05,   9.11312400e+04],
[  0.00000000e+00,   1.00000000e+00,   6.11363800e+04,
   1.52701920e+05,   8.82182300e+04],
[  0.00000000e+00,   0.00000000e+00,   6.34088600e+04,
   1.29219610e+05,   4.60852500e+04],
[  1.00000000e+00,   0.00000000e+00,   5.54939500e+04,
   1.03057490e+05,   2.14634810e+05],
[  0.00000000e+00,   0.00000000e+00,   4.64260700e+04,
   1.57693920e+05,   2.10797670e+05],
[  0.00000000e+00,   1.00000000e+00,   4.60140200e+04,
   8.50474400e+04,   2.05517640e+05],
[  1.00000000e+00,   0.00000000e+00,   2.86637600e+04,
   1.27056210e+05,   2.01126820e+05],
[  0.00000000e+00,   0.00000000e+00,   4.40699500e+04,
   5.12831400e+04,   1.97029420e+05],
[  0.00000000e+00,   1.00000000e+00,   2.02295900e+04,
   6.59479300e+04,   1.85265100e+05],
[  0.00000000e+00,   0.00000000e+00,   3.85585100e+04,
   8.29820900e+04,   1.74999300e+05],
[  0.00000000e+00,   0.00000000e+00,   2.87543300e+04,
   1.18546050e+05,   1.72795670e+05],
[  1.00000000e+00,   0.00000000e+00,   2.78929200e+04,
   8.47107700e+04,   1.64470710e+05],
[  0.00000000e+00,   0.00000000e+00,   2.36409300e+04,
   9.61896300e+04,   1.48001110e+05],
[  0.00000000e+00,   1.00000000e+00,   1.55057300e+04,
   1.27382300e+05,   3.55341700e+04],
[  0.00000000e+00,   0.00000000e+00,   2.21777400e+04,
   1.54806140e+05,   2.83347200e+04],
[  0.00000000e+00,   1.00000000e+00,   1.00023000e+03,
   1.24153040e+05,   1.90393000e+03],
[  1.00000000e+00,   0.00000000e+00,   1.31546000e+03,
   1.15816210e+05,   2.97114460e+05],
[  0.00000000e+00,   0.00000000e+00,   0.00000000e+00,
   1.35426920e+05,   0.00000000e+00],
[  0.00000000e+00,   1.00000000e+00,   5.42050000e+02,
   5.17431500e+04,   0.00000000e+00],
[  0.00000000e+00,   0.00000000e+00,   0.00000000e+00,
   1.16983800e+05,   4.51730600e+04]])
```

In [9]:
```
from sklearn.cross_validation import train_test_split
x_train, x_test, y_train, y_test = train_test_split(x,y,test_size = 0.2, rando
m_state=0)
x_train, x_test, y_train, y_test
```

```
Out[9]: (array([[  1.00000000e+00,   0.00000000e+00,   5.54939500e+04,
                   1.03057490e+05,   2.14634810e+05],
                [  0.00000000e+00,   1.00000000e+00,   4.60140200e+04,
                   8.50474400e+04,   2.05517640e+05],
                [  1.00000000e+00,   0.00000000e+00,   7.53288700e+04,
                   1.44135980e+05,   1.34050070e+05],
                [  0.00000000e+00,   0.00000000e+00,   4.64260700e+04,
                   1.57693920e+05,   2.10797670e+05],
                [  1.00000000e+00,   0.00000000e+00,   9.17491600e+04,
                   1.14175790e+05,   2.94919570e+05],
                [  1.00000000e+00,   0.00000000e+00,   1.30298130e+05,
                   1.45530060e+05,   3.23876680e+05],
                [  1.00000000e+00,   0.00000000e+00,   1.19943240e+05,
                   1.56547420e+05,   2.56512920e+05],
                [  0.00000000e+00,   1.00000000e+00,   1.00023000e+03,
                   1.24153040e+05,   1.90393000e+03],
                [  0.00000000e+00,   1.00000000e+00,   5.42050000e+02,
                   5.17431500e+04,   0.00000000e+00],
                [  0.00000000e+00,   1.00000000e+00,   6.56054800e+04,
                   1.53032060e+05,   1.07138380e+05],
                [  0.00000000e+00,   1.00000000e+00,   1.14523610e+05,
                   1.22616840e+05,   2.61776230e+05],
                [  1.00000000e+00,   0.00000000e+00,   6.19944800e+04,
                   1.15641280e+05,   9.11312400e+04],
                [  0.00000000e+00,   0.00000000e+00,   6.34088600e+04,
                   1.29219610e+05,   4.60852500e+04],
                [  0.00000000e+00,   0.00000000e+00,   7.80131100e+04,
                   1.21597550e+05,   2.64346060e+05],
                [  0.00000000e+00,   0.00000000e+00,   2.36409300e+04,
                   9.61896300e+04,   1.48001110e+05],
                [  0.00000000e+00,   0.00000000e+00,   7.62538600e+04,
                   1.13867300e+05,   2.98664470e+05],
                [  0.00000000e+00,   1.00000000e+00,   1.55057300e+04,
                   1.27382300e+05,   3.55341700e+04],
                [  0.00000000e+00,   1.00000000e+00,   1.20542520e+05,
                   1.48718950e+05,   3.11613290e+05],
                [  0.00000000e+00,   0.00000000e+00,   9.19923900e+04,
                   1.35495070e+05,   2.52664930e+05],
                [  0.00000000e+00,   0.00000000e+00,   6.46647100e+04,
                   1.39553160e+05,   1.37962620e+05],
                [  0.00000000e+00,   1.00000000e+00,   1.31876900e+05,
                   9.98147100e+04,   3.62861360e+05],
                [  0.00000000e+00,   1.00000000e+00,   9.46571600e+04,
                   1.45077580e+05,   2.82574310e+05],
                [  0.00000000e+00,   0.00000000e+00,   2.87543300e+04,
                   1.18546050e+05,   1.72795670e+05],
                [  0.00000000e+00,   0.00000000e+00,   0.00000000e+00,
                   1.16983800e+05,   4.51730600e+04],
                [  0.00000000e+00,   0.00000000e+00,   1.62597700e+05,
                   1.51377590e+05,   4.43898530e+05],
                [  1.00000000e+00,   0.00000000e+00,   9.38637500e+04,
                   1.27320380e+05,   2.49839440e+05],
                [  0.00000000e+00,   0.00000000e+00,   4.40699500e+04,
                   5.12831400e+04,   1.97029420e+05],
                [  0.00000000e+00,   1.00000000e+00,   7.70440100e+04,
                   9.92813400e+04,   1.40574810e+05],
                [  0.00000000e+00,   0.00000000e+00,   1.34615460e+05,
```

```
           1.47198870e+05,   1.27716820e+05],
         [  1.00000000e+00,   0.00000000e+00,   6.75325300e+04,
           1.05751030e+05,   3.04768730e+05],
         [  1.00000000e+00,   0.00000000e+00,   2.86637600e+04,
           1.27056210e+05,   2.01126820e+05],
         [  0.00000000e+00,   1.00000000e+00,   7.83894700e+04,
           1.53773430e+05,   2.99737290e+05],
         [  0.00000000e+00,   1.00000000e+00,   8.64197000e+04,
           1.53514110e+05,   0.00000000e+00],
         [  0.00000000e+00,   0.00000000e+00,   1.23334880e+05,
           1.08679170e+05,   3.04981620e+05],
         [  0.00000000e+00,   0.00000000e+00,   3.85585100e+04,
           8.29820900e+04,   1.74999300e+05],
         [  1.00000000e+00,   0.00000000e+00,   1.31546000e+03,
           1.15816210e+05,   2.97114460e+05],
         [  0.00000000e+00,   1.00000000e+00,   1.44372410e+05,
           1.18671850e+05,   3.83199620e+05],
         [  0.00000000e+00,   1.00000000e+00,   1.65349200e+05,
           1.36897800e+05,   4.71784100e+05],
         [  0.00000000e+00,   0.00000000e+00,   0.00000000e+00,
           1.35426920e+05,   0.00000000e+00],
         [  0.00000000e+00,   0.00000000e+00,   2.21777400e+04,
           1.54806140e+05,   2.83347200e+04]]),
array([[  1.00000000e+00,   0.00000000e+00,   6.60515200e+04,
           1.82645560e+05,   1.18148200e+05],
         [  0.00000000e+00,   0.00000000e+00,   1.00671960e+05,
           9.17906100e+04,   2.49744550e+05],
         [  1.00000000e+00,   0.00000000e+00,   1.01913080e+05,
           1.10594110e+05,   2.29160950e+05],
         [  1.00000000e+00,   0.00000000e+00,   2.78929200e+04,
           8.47107700e+04,   1.64470710e+05],
         [  1.00000000e+00,   0.00000000e+00,   1.53441510e+05,
           1.01145550e+05,   4.07934540e+05],
         [  0.00000000e+00,   1.00000000e+00,   7.21076000e+04,
           1.27864550e+05,   3.53183810e+05],
         [  0.00000000e+00,   1.00000000e+00,   2.02295900e+04,
           6.59479300e+04,   1.85265100e+05],
         [  0.00000000e+00,   1.00000000e+00,   6.11363800e+04,
           1.52701920e+05,   8.82182300e+04],
         [  1.00000000e+00,   0.00000000e+00,   7.39945600e+04,
           1.22782750e+05,   3.03319260e+05],
         [  1.00000000e+00,   0.00000000e+00,   1.42107340e+05,
           9.13917700e+04,   3.66168420e+05]]),
33     96778.92
35     96479.51
26    105733.54
34     96712.80
18    124266.90
7     155752.60
14    132602.65
45     64926.08
48     35673.41
29    101004.64
15    129917.04
30     99937.59
32     97427.84
16    126992.93
```

```
42     71498.49
20    118474.03
43     69758.98
8     152211.77
13    134307.35
25    107404.34
5     156991.12
17    125370.37
40     78239.91
49     14681.40
1     191792.06
12    141585.52
37     89949.14
24    108552.04
6     156122.51
23    108733.99
36     90708.19
21    111313.02
19    122776.86
9     149759.96
39     81005.76
46     49490.75
3     182901.99
0     192261.83
47     42559.73
44     65200.33
Name: Profit, dtype: float64,
28    103282.38
11    144259.40
10    146121.95
41     77798.83
2     191050.39
27    105008.31
38     81229.06
31     97483.56
22    110352.25
4     166187.94
Name: Profit, dtype: float64)
```

In [10]:
```
#fitting MLR to trainig set
from sklearn.linear_model import LinearRegression
regressor=LinearRegression()
regressor.fit(x_train,y_train)
```

Out[10]:
```
LinearRegression(copy_X=True, fit_intercept=True, n_jobs=1, normalize=False)
```

In [12]:
```
#predict the Test set Results
y_pred = regressor.predict(x_test)
y_pred
```

Out[12]:
```
array([ 103015.20159796,  132582.27760815,  132447.73845175,
         71976.09851258,  178537.48221056,  116161.24230166,
         67851.69209676,   98791.73374687,  113969.43533013,
        167921.06569551])
```