

ML LAB TEST – 2

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Date: 14/06/2021

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Section: 6A

Question:

Implement the Linear Regression algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs.

Sub	X	Y
1	43	95
2	21	65
3	25	79
4	42	75
5	57	87
6	59	81
7	55	?

Program:

```
In [1]:
import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)
import matplotlib.pyplot as plt

import os
for dirname, _, filenames in os.walk('/kaggle/input'):
    for filename in filenames:
        print(os.path.join(dirname, filename))

In [2]:
def coefficient(x,y):
    n = np.size(x)
    meanx = np.mean(x)
    meany = np.mean(y)
    SS_xy = np.sum(y*x) - n*meanx*meanx
```

```

SS_xx = np.sum(x*x) - n*meanx*meanx
t1 = SS_xy/SS_xx
t0 = meany - t1*meanx
return (t0,t1)

```

In [3]:

```

def plot_line(x,y,t):
    plt.scatter(x, y, color = 'blue', marker = 'o', s = 30)
    ypred = t[0] + t[1]*x
    plt.plot(x, ypred, color = 'red')
    plt.xlabel('X')
    plt.ylabel('Y')
    plt.show()

```

In [4]:

```

def main():
    x1,y1 = [],[]
    with open('../input/ml-lab2/dataset.csv', 'r') as csvinput: #Taking csv file input
        next(csvinput)
        for row in csv.reader(csvinput):
            i,j = row[0],row[1]
            x1.append(i)
            y1.append(j)
    x = np.array(x1).astype(np.float)
    y = np.array(y1).astype(np.float)
    print("X: ",x,"\nY: ",y)
    t = coefficient(x,y)
    print("The estimated coefficients are: \nt0 = {} \nt1 = {}".format(t[0],t[1]))
    plot_line(x,y,t)
    h = t[0] + t[1]*55
    print("Predicted value of y for (x = 55):", h)

```

In [5]:

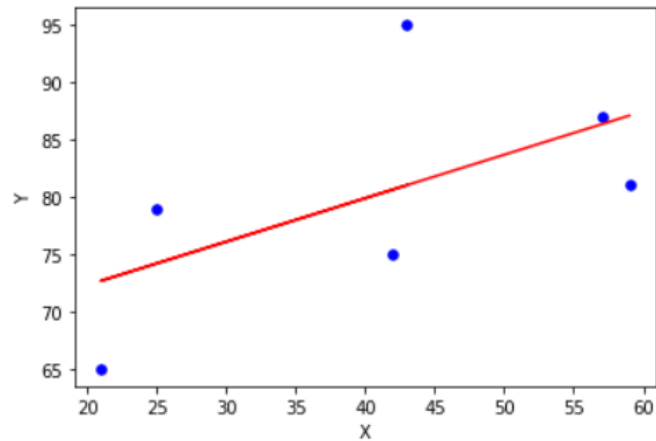
```

main()

```

Output:

```
X: [43. 21. 25. 42. 57. 59.]  
Y: [95. 65. 79. 75. 87. 81.]  
The estimated coefficients are:  
t0 = 64.7182001343183  
t1 = 0.37931497649429224
```



Predicted value of y for (x = 55): 85.58052384150437

Final predicted value for y when x = 55 using linear regression algorithm = 85.58