DWML

CLASS: TE CMPN A **PID:182027**
NAME: Rebecca Dias **ROLL NO.: 19**

Aim: Implement Linear Simple Regression model

Code:

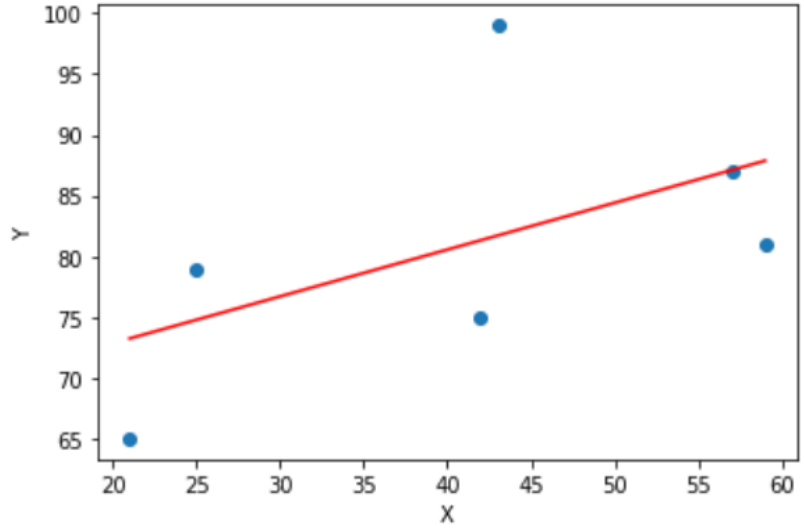
```
import numpy as np
import matplotlib.pyplot as plt
def predict(b0,b1,x):
    return b1+b0*x
def coefficient(x,y):
    xm=np.mean(x)
    ym=np.mean(y)
    X2=[(x[i])* (x[i]) for i in range(len(x))]
    Y2=[(y[i])* (y[i]) for i in range(len(y))]
    XY=[(y[i])* (x[i]) for i in range(len(y))]
    num1=sum(y)*sum(X2)-sum(x)*sum(XY)
    den=len(x)*sum(X2)-sum(x)**2
    num2=len(x)*sum(XY)-sum(x)*sum(y)
    b1=num1/den
    b0=num2/den
    return b0,b1

# x=list(map(int,input("Enter x  : ").split()))
x=[43,21,25,42,57,59]
# y=list(map(int,input("Enter y : ").split()))
y=[99,65,79,75,87,81]

b0,b1=coefficient(x,y)
print("a : ",b1,"\n","b : ",b0)
# n=int(input("Enter value : "))
n=75
print("Expected Glucose level : ",predict(b0,b1,n))
x1=np.linspace(min(x),max(x),10)
y1=b1+b0*x1
plt.scatter(x,y)
plt.xlabel("X")
plt.ylabel("Y")
plt.plot(x1,y1,'-r')
plt.show()
```

Output:

```
a :  65.1415715245131
 b :  0.3852249832102082
Expected Glucose level :  94.03344526527871
```



Sum:

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Aim: Implement Linear Regression model

Subject	Age x	Glucose lvl y	xy	x^2	y^2
1	43	99	4257	1849	9801
2	21	65	1365	441	4225
3	25	79	1975	625	6241
4	42	75	3150	1764	5625
5	57	87	4959	3249	7569
6	59	81	4779	3481	6561
Total	247	486	20485	11409	40022

$n = 6$

$\Sigma x = 247 \quad \Sigma y = 486$

$\Sigma xy = 20485 \quad \Sigma x^2 = 11409 \quad \Sigma y^2 = 40022$

$$a = \frac{(\Sigma y)(\Sigma x^2) - (\Sigma x)(\Sigma xy)}{n(\Sigma x^2) - (\Sigma x)^2}$$

$$= \frac{(486 \times 11409) - (247 \times 20485)}{6(11409) - (247)^2}$$

$$= 65.14$$

$$b = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{n(\Sigma x^2) - (\Sigma x)^2}$$

$$= \frac{6(20485) - (247 \times 486)}{6(11409 - (247)^2}$$

$$= 0.38522$$

$a = 65.1416$
$b = 0.38522$

Insert value into equation $y = a + bx$

$y = a + bx$
$y = 65.141 + 0.38522\,x$

when $x = 75$.

$y = 65.141 + 0.38522 \times 75$
$= 94.0325$

$\therefore$ when $x = 75$; $y = 94.0325$