

✓ Manual computation of Simple Linear Regression without using any inbuilt functions

For the given x and y, computing a and b

```
x = [0, 1, 2, 3, 4]
y = [2, 3, 5, 4, 6]
a = ((len(x) * sum(i * j for i, j in zip(x, y))) - (sum(i for i in x) * sum(i for i in y))) / (len(x) * sum(i**2 for i in x) - (sum(i for i in :
a
b = (sum(i for i in y) - (a*(sum(i for i in x)))) / len(x)
b
```

Now substituting the values of a and b in regression line equation

```
print( "The least square regression line is y=",a, "x+",b )
```

➞ The least square regression line is y= 0.9 x+ 2.2

For the given value of X, finding the value of y

```
X= 10
ax= a*X
print("If X=",X,"then Y =",ax+b)
```

➞ If X= 10 then Y = 11.2

Defining a function for the computation of Simple linear regression

```
def linearreg(x,y,X):

    # Taking values of x and y as input from user
    xip = input("Enter x separated by commas: ")
    x = [int(x) for x in xip.split(',')]
    xip = input("Enter y separated by commas: ")
    y = [int(x) for x in xip.split(',')]

    # Checking if the length of x and y are equal
    if len(x)!=len(y):
        print("Invalid Input: Length of x and y must be equal")
        return

    # If equal, Compute the equation of linear regression
    X = int(input("Enter X: "))
    a = ((len(x) * sum(i * j for i, j in zip(x, y))) - (sum(i for i in x) * sum(i for i in y))) / (len(x) * sum(i**2 for i in x) - (sum(i for
a
b = (sum(i for i in y) - (a*(sum(i for i in x)))) / len(x)
b
print( "The least square regression line is y=",a, "x+",b )

    # The value of Y for the given X
    ax= a*X
    print("If X=",X,"then Y =",ax+b)

linearreg(x,y,X)
```

➞ Enter x separated by commas: 0,1,2,3,4
Enter y separated by commas: 2,3,5,4,6
Enter X: 10
The least square regression line is y= 0.9 x+ 2.2
If X= 10 then Y = 11.2

