A PYTHON PROGRAM TO IMPLEMENT SIMPLE LINEAR REGRESSION USING LEAST SQUARE METHOD

Expt no. 2

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PROGRAM:

```
import pandas as pd
import matplotlib.pyplot as plt
import numpy as np
data = pd.read_csv("C:\\Users\\Luqman\\Downloads\\archive (3)\\headbrain.csv")
x,y = np.array(list(data['Head Size(cm^3)'])), np.array(list(data['Brain Weight(grams)']))
print(x[:5],y[:5])
#[4512373842613777 4177][15301297133512821590]
def get_line(x,y):
    x_m, y_m = np.mean(x),np.mean(y)
    print(x_m,y_m)
    x_d,y_d = x-x_m, y-y_m
    m= np.sum(x_d*y_d)/np.sum(x_d**2)
    c = y_m - (m*x_m)
    print(m,c)
    return lambda x: m*x+c
lin = get_line(x,y)
X=np.linspace(np.min(x)-100,np.max(x)+100,1000)
Y = np.array([lin(x) for x in X])
plt.plot(X,Y,color='red',label='Regression line')
plt.scatter(x,y,color='green',label='Scatter plot')
plt.xlabel('Head Size(cm^3)')
plt.ylabel('Brain Weight(grams)')
plt.legend()
plt.show()
```

OUTPUT:

```
[4512 3738 4261 3777 4177] [1530 1297 1335 1282 1590]
3633.9915611814345 1282.873417721519
0.2634293394893993 325.5734210494428
```