

# Implementation-of-Linear-Regression-

## Using-Gradient-Descent

### AIM:

To write a program to implement the linear regression using gradient descent.

### Equipments Required:

1. Hardware – PCs
2. Anaconda – Python 3.7 Installation / Moodle-Code Runner

### Algorithm

1. Use the standard libraries in python for Gradient Design.
2. Upload the dataset and check any null value using `.isnull()` function.
3. Declare the default values for linear regression.
4. Calculate the loss using Mean Square Error
5. Predict the value of y. 6. Plot the graph respect to hours and scores using scatter plot function.

### Program:

```
'''
Program to implement the linear regression using gradient descent.
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'''

import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
data=pd.read_csv("/content/student_scores - student_scores.csv")
data.head()

#checkig for Null Values in Dataset
data.isnull().sum()
```

```

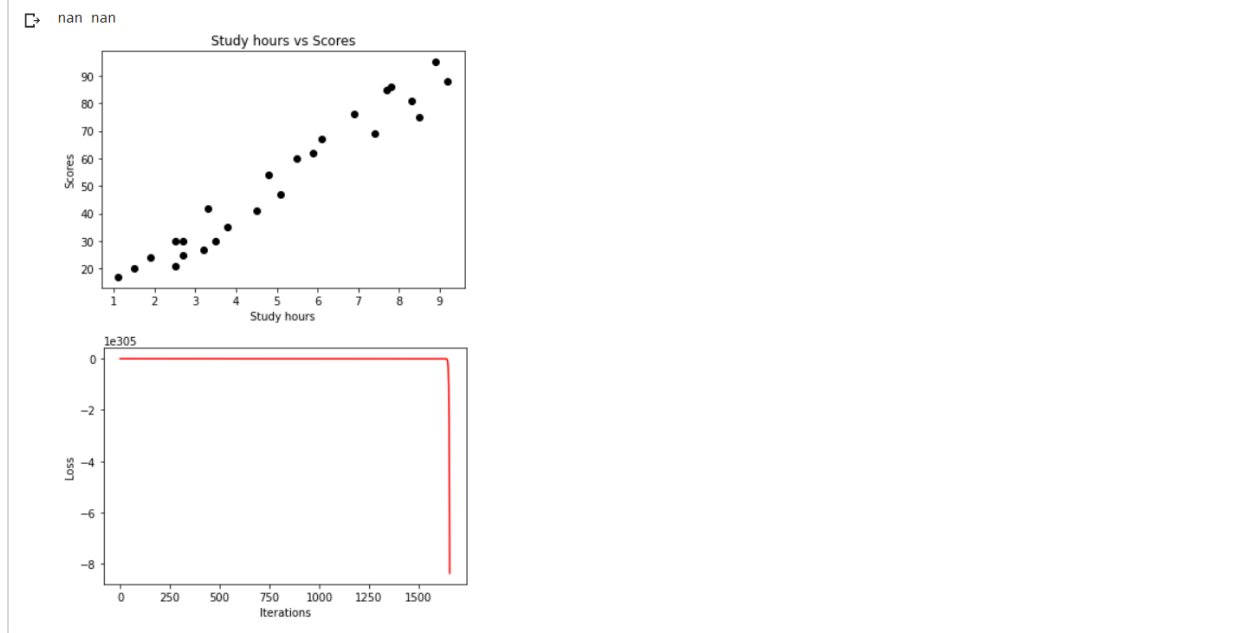
#To calculate Gradient decent and linear Decent
x=data.Hours
y=data.Scores
y.head()
n=len(x)
m=0
c=0
L=0.001
loss=[]
for i in range(10000):
    ypred=m*x+c
    MSE=(1/n)*sum((ypred-y)**2)
    dm=(2/n)*sum(x*(ypred-y))
    dc=(2/n)*sum(ypred-y)
    c=c-L*dc
    m=m-L*dm
    loss.append(MSE)
    #print(m)
print(m,c)

#Plotting Linear Regression Graph
y_pred=m*x+c
plt.scatter(x,y,color="black")
plt.plot(x,y_pred,color="red")
plt.xlabel("Study hours")
plt.ylabel("Scores")
plt.title("Study hours vs Scores")
plt.show()

#Plotting Gradient Decent Graph
plt.plot(loss, color="red")
plt.xlabel("Iterations")
plt.ylabel("Loss")
plt.show()

```

## Output:



## Result:

Thus the program to implement the linear regression using gradient descent is written and verified using python programming.