

FACULTYOF TECHNOLOGY

Department of Computer Engineering Machine Learning Lab Manual

Practical 5. Develop a cost function of linear regression using sample dataset..

Code:

```
import numpy as np
import matplotlib.pyplot as plt
from typing extensions import final
X = \text{np.array}([1, 2, 3, 4, 5])
Y = np.array([1, 2, 3, 4, 5])
plt.scatter(X, Y)
m = len(Y)
theta0 = 0.0
theta 1 = 0.0
def hypothesis(X, theta0, theta1):
  return theta0 + theta1 * X
def cost function(theta0, theta1, X, Y):
  total cost = 0
  for i in range(m):
     total cost += (hypothesis(X[i], theta0, theta1) - Y[i]) ** 2
  return total cost / (2 * m)
theta1 values = np.linspace(-10, 10, 100)
cost values =[]
for theta1 in theta1 values:
 cost = cost function(theta0, theta1, X, Y)
cost values.append(cost)
plt.plot(theta1 values, cost values, label='Cost
Function')
plt.xlabel('Theta1')
plt.ylabel('Cost')
plt.title('Cost Function For LInear Regression')
plt.legend()
```

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```
plt.show() \\ initial\_cost = cost\_function(theta0, theta1, X, Y) \\ print(f"Initial Cost(MSE) with theta0 = \{theta0\} , and theta1 = \{theta1\} : \\ \{initial\_cost\}") \\ theta0\_exp = 0.2 \\ theta1\_exp = 0.8 \\ final\_cost = cost\_function(theta0\_exp, theta1\_exp, X, Y) \\ print(f"Final Cost: \{final\_cost\}") \\ print(f"Final Cost (MSE) with theta0 = \{theta0\} and theta1 = \{theta1\} : \{final\_cost\}") \\ final\_cost = (theta0) and theta1 = \{theta1\} : \{theta1
```

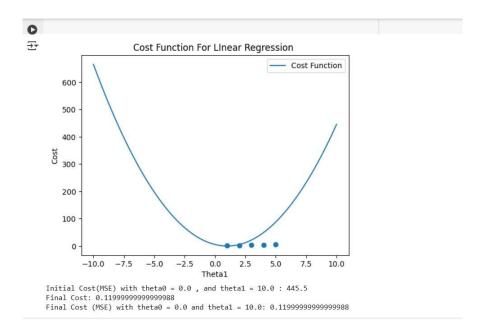
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Output:



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