

EX 9

CODING :

```
X = [1,2,3,4,5]
y = [2,5,10,17,26]
w = b = 0
lr = 0.01

for _ in range(1000):
    dw = db = 0
    for i in range(len(X)):
        y_pred = w*X[i] + b
        dw += (y_pred - y[i]) * X[i]
        db += (y_pred - y[i])
    w -= lr * dw
    b -= lr * db

linear_error = sum((w*X[i]+b - y[i])**2 for i in range(len(X)))

a = b2 = c = 0

for _ in range(1000):
    da = db2 = dc = 0
    for i in range(len(X)):
        y_pred = a*X[i]**2 + b2*X[i] + c
        da += (y_pred - y[i]) * X[i]**2
        db2 += (y_pred - y[i]) * X[i]
        dc += (y_pred - y[i])
    a -= lr * da
    b2 -= lr * db2
    c -= lr * dc

poly_error = sum((a*X[i]**2 + b2*X[i] + c - y[i])**2 for i in range(len(X)))
print("Linear Regression Error:", linear_error)
print("Polynomial Regression Error:", poly_error)
```

OUTPUT:

main.py

```
1 X = [1,2,3,4,5]
2 y = [2,5,10,17,26]
3 w = b = 0
4 lr = 0.01
5 for _ in range(10000):
6     dw = db = 0
7     for i in range(len(X)):
8         y_pred = w*X[i] + b
9         dw += (y_pred - y[i]) * X[i]
10        db += (y_pred - y[i])
11    w -= lr * dw
12    b -= lr * db
13 linear_error = sum((w*X[i]+b - y[i])**2 for i in range(len(X)))
14 a = b2 = c = 0
15 for _ in range(1000):
16     da = db2 = dc = 0
17     for i in range(len(X)):
18         y_pred = a*X[i]**2 + b2*X[i] + c
19         da += (y_pred - y[i]) * X[i]**2
20         db2 += (y_pred - y[i]) * X[i]
21         dc += (y_pred - y[i])
22     a -= lr * da
23     b2 -= lr * db2
24     c -= lr * dc
25
26 poly_error = sum((a*X[i]**2 + b2*X[i] + c - y[i])**2 for i in range(len(X)))
27 print("Linear Regression Error:", linear_error)
28 print("Polynomial Regression Error:", poly_error)
29
```

Run

Output

Clear

ERROR!
Linear Regression Error: 14.000001952907278
Polynomial Regression Error: nan
==== Code Execution Successful ===