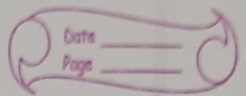


19/3/25

Lab-3



Linear regression.

import numpy as np

import matplotlib.pyplot as plt

x = np.array([1, 2, 3, 4, 5])

y = np.array([1.2, 1.8, 2.6, 3.2, 3.8])

x_b = np.c_[np.ones((x.shape[0], 1)), x]
bias term (intercept)

coeffs (intercept & slope)

theta = np.linalg.inv(x_b.T.dot(x_b)).dot(x_b.T.
dot(y)

intercept, slope = theta

print(f"Intercept (theta0): {intercept}")

print(f"Slope (theta1): {slope}")

x_input = float(input("Enter a value of x to
predict y: "))

x_input_b = np.array([1, x_input])

Add 1 to bias term

y_pred = x_input_b.dot(theta)

print(f"Predicted y for x = {x_input}: {y_pred}")

plt.scatter(x, y, color='blue', label='Data Points')

plt.plot(x, x_b.dot(theta), color='red',
label='Regression line')

plt.xlabel('x')

plt.ylabel('y')

```
plt.title('Linear Regressm - Model Fit')  
plt.legend()  
plt.show()
```

O/P:

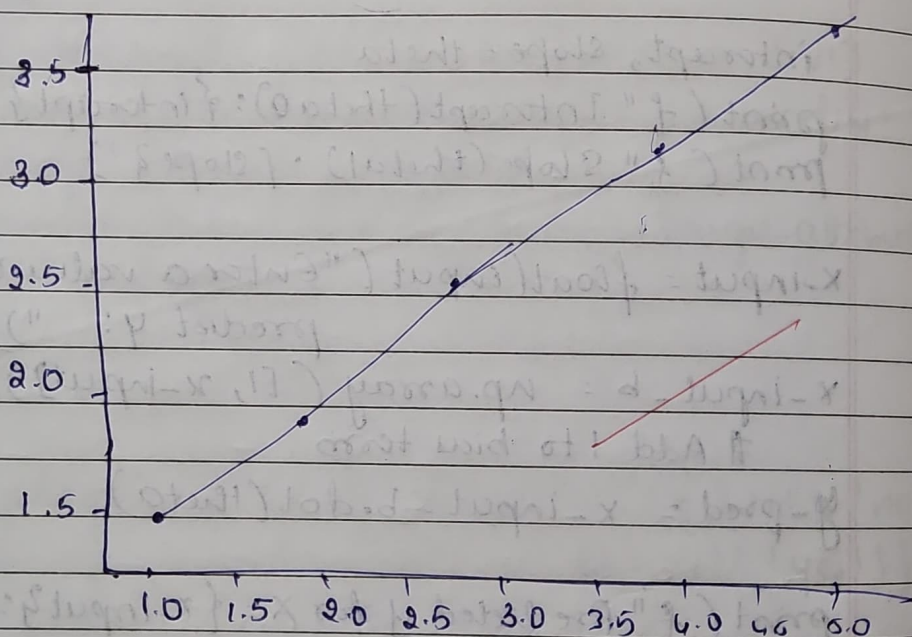
Intercept (theta 0) = 0.5400

Slope (theta 1) = 0.6600

Enter a value for x to predict y = 7

Predicted y for X = 7.0 : 5.1600

Linear Regressm - Model fit




```
import numpy as np
import matplotlib.pyplot as plt
import sklearn.linear_model import LinearRegression
```

```
X = np.array([1, 2, 3, 4, 5]).reshape(-1, 1)
y = np.array([1.2, 1.8, 2.6, 3.2, 3.8])
```

```
model = LinearRegression()
```

```
model.fit(X, y)
```

```
intercept = model.intercept_
slope = model.coef_[0]
```

```
print(f"Intercept (theta0): {intercept}")
print(f"Slope (theta1): {slope}")
```

```
x_input = float(input("Enter a value for x to  
predict y: "))
```

```
y_pred = model.predict([x_input])
```

```
print(f"Predicted y for x = {x_input}: {y_pred[0]}")
```

O/p:

Intercept (theta0): 0.5600

Slope (theta1): 0.66

Enter a value for x to predict y: 7

predicted y for x = 7.0 : 5.16

19-3-2023