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**ROLL NO:- 173**

**PRACTICAL NO. :-**

**PRACTICAL NAME :- . WRITE A PROGRAM FOR LINEAR REGRESSION AND FIND PARAMETERS LIKE SUM OF SQUARED ERRORS (SSE), TOTAL SUM OF SQUARES (SST), R2, ADJUSTED R2, ETC**

importnumpy as np

fromsklearn.linear\_model import LinearRegression

fromsklearn.metrics import r2\_score

# Input data

X = np.array([[1, 1], [1, 2], [2, 2], [2, 3]])

y = np.array([3, 4, 5, 6])

model = LinearRegression() # Create a linear regression model

model.fit(X, y) # Fit the model to the data

y\_pred = model.predict(X) # Predict the output

sse = np.sum((y\_pred - y) \*\* 2) # Calculate SSE (Sum of Squared Errors)

sst = np.sum((y - np.mean(y)) \*\* 2) # Calculate SST (Total Sum of Squares)

r2 = r2\_score(y, y\_pred) # Calculate R2 score

# Calculate adjusted R2

n = X.shape[0] # Number of samples

p = X.shape[1] # Number of predictors

adjusted\_r2 = 1 - (1 - r2) \* (n - 1) / (n - p - 1)

# Print the results

print("Sum of Squared Errors(SSE):- ", sse)

print("Total Sum of Squares(SST):- ", sst)

print("R Square(R2):- ", r2)

print("Adjusted Square(R2):- ", adjusted\_r2 )

**OUTPUT:**

Sum of Squared Errors(SSE):- 0.0

Total Sum of Squares(SST):- 5.0

R Square(R2):- 1.0

Adjusted Square(R2):- 1.0