Class Activity 01

Topic: Gradient Descent

Total Marks: 2

Problem Statement:

Given the following simple linear regression model:

$y_p=\theta_0+\theta_1 \cdot x$

where:

- y_p is the predicted output,
- x is the input feature,
- y in the table is the actual output
- θ_0 and θ_1 are the parameters of the model.

You are provided with a small dataset:

X	y
1	3
2	5
3	7

Task:

1. **Initialization**: Start with initial guesses $\theta_0= 0$ and $\theta_1=0$
2. **Gradient Descent Update**: Perform one iteration of gradient descent using a learning rate $\alpha=0.01$. Calculate the gradients for both θ_0 and θ_1, update the parameters, and show the updated values.
3. **Error Calculation**: Calculate the Mean Squared Error (MSE) after the update.

Instructions:

- Show your calculations step by step.
- Explain each step of the gradient descent process briefly.
- You may use a calculator for arithmetic operations.