ASSIGNMENT 4

LOGISTIC REGRESSION

AI LAB

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Q1.Use logistic regression to find decision boundary For the given database. Set your learning rate to 0.1. What is the cost function value and learning parameter value after convergence?

Final Parameters (Theta):

$$\Theta_0 = 0.04814252$$
$$\Theta_1 = 0.61466886$$
$$\Theta_2 = -0.70378494$$

Final Cost: 0.6054171650220601

Q2. Plot cost function v/s iteration graph for the model trained in question 1.

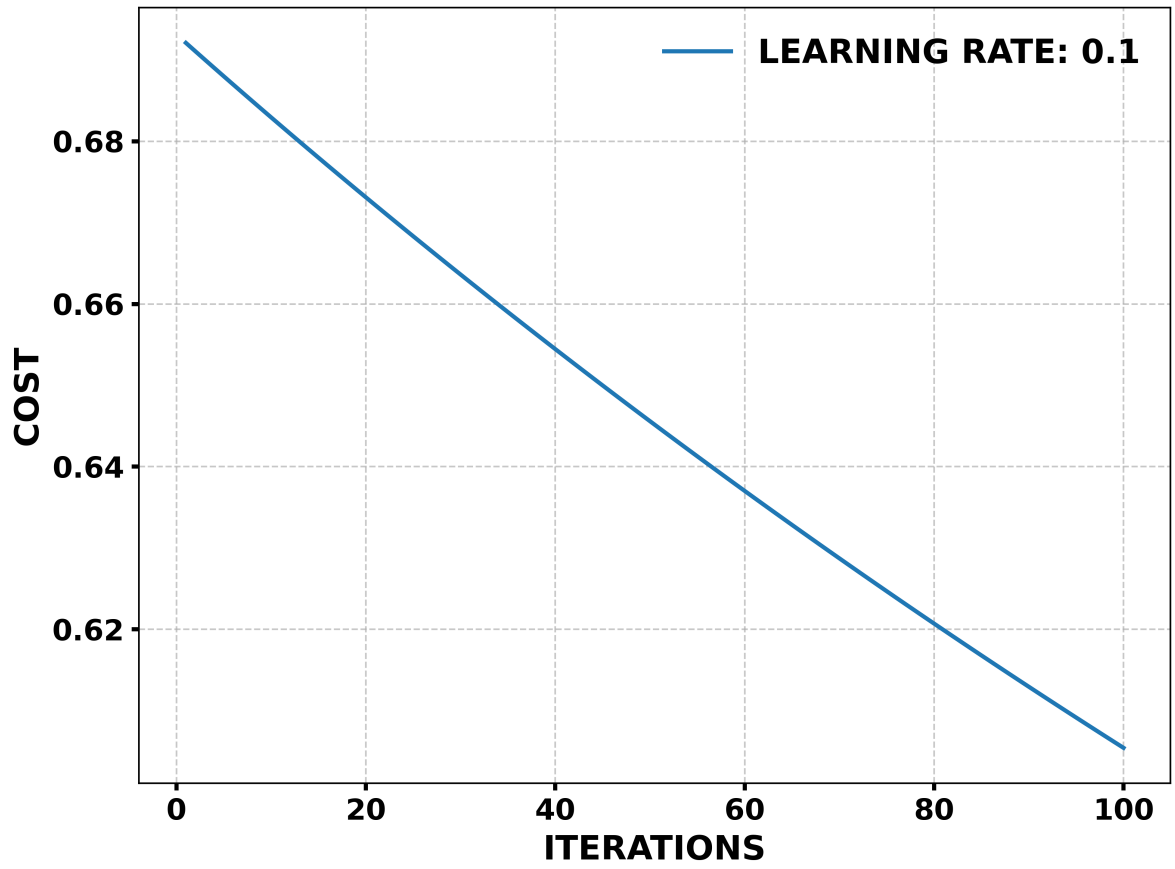

Figure 1: COST FUNCTION V/S. ITERATION

Q3. Plot the given dataset on a graph, use different colours for different classes and also show the decision boundary you obtained in question 1. Do not use scatter plot.

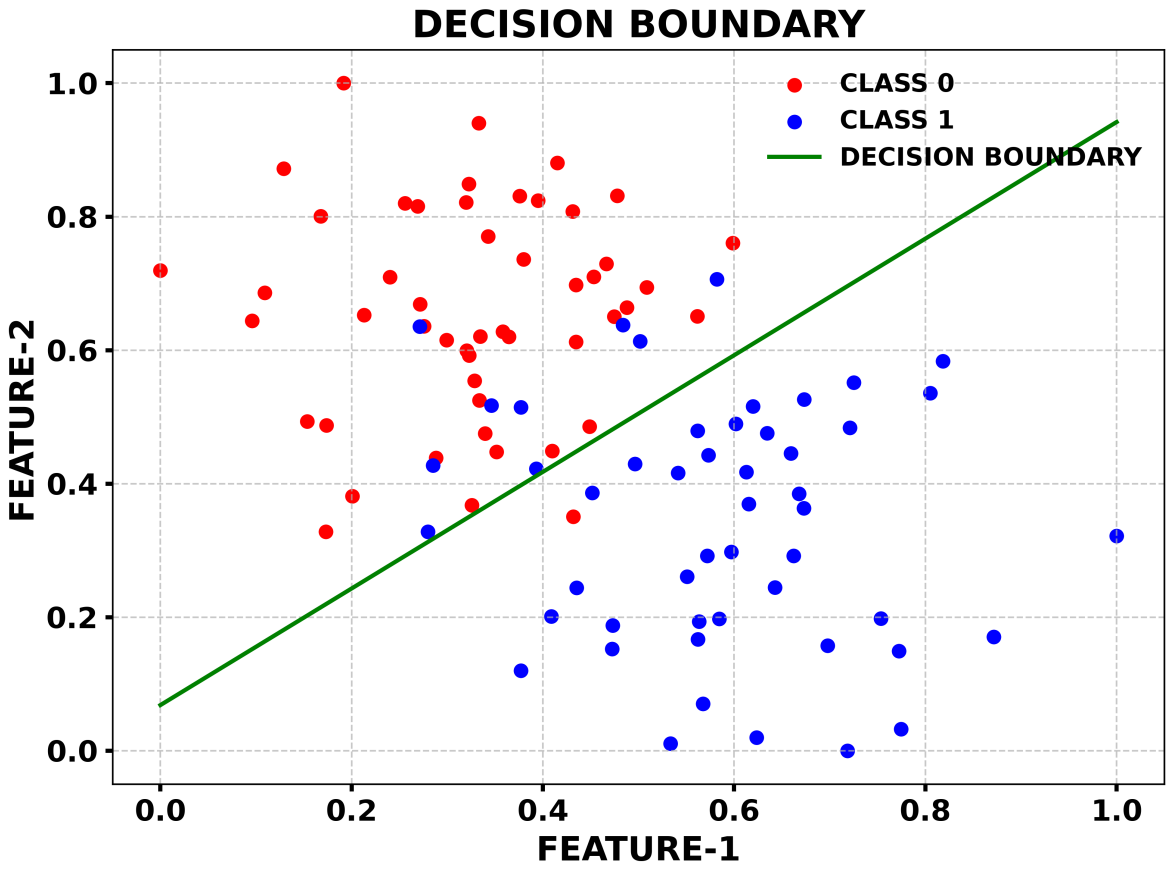

Figure 2: DATA SET AND DECISION BOUNDARY

Q4. Train your model with a learning rate of 0.1 and 5. Plot the cost-function v/s iteration curve for both learning rates on the same graph. For this task, only train your model for 100 iterations.

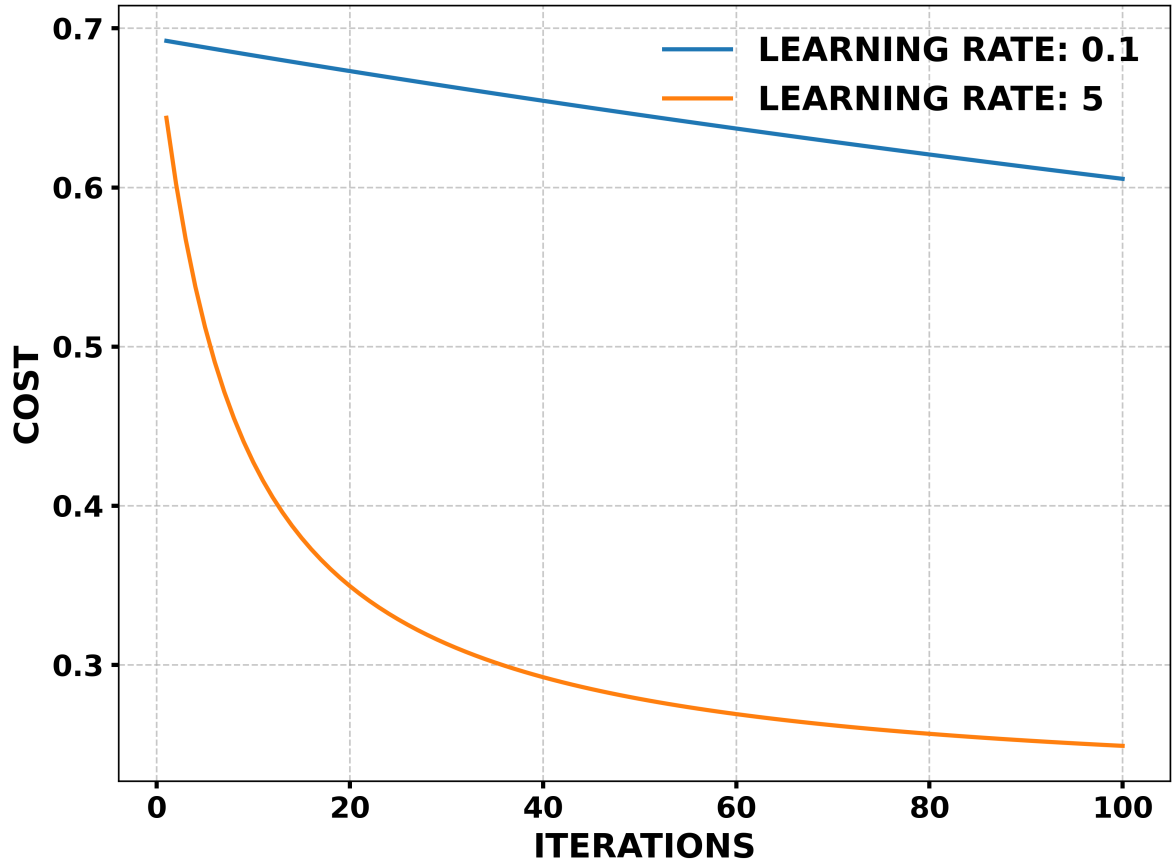

Figure 3: COST FUNCTION FOR DIFFERENT LEARNING RATE

Q5. Find the confusion matrix for your training dataset. Using the confusion matrix to calculate the accuracy, precision, recall, F1-score.

Confusion Matrix:

$$\begin{bmatrix} 41 & 1 \\ 9 & 49 \end{bmatrix}$$

Metrics:

Accuracy: 0.90
Precision: 0.98
Recall: 0.82
F1 Score: 0.89