Assignment L2

You have been provided with a synthetic dataset generated using NumPy, which contains two features (`x1`, `x2`) and a binary class label (`class`). Your task is to build and train a logistic regression model using PyTorch to predict the class label based on `x1` and `x2`. (20 marks)

Task

1. **Data Preparation**: Convert the features and labels from the pandas DataFrame into PyTorch tensors. Split the data into a training set and a test set.

2. **Model Building**: Define a logistic regression model in PyTorch. This can be a simple linear layer with an appropriate activation function.

3. **Training the Model**: Define a suitable loss function and optimizer for binary classification. Implement the training loop, including both the forward and backward passes.

4. **Evaluation**: After training, evaluate the performance of your model on the test set. You may use metrics such as accuracy to assess the performance.

5. **Bonus Challenge**: Experiment with different learning rates and observe how they affect the convergence and performance of your model.

Deliverables

- Python code that completes the above tasks.

- A brief report on the performance of your model, including any insights you gained from the experiment with different learning rates.