Ahsanullah University of Science and Technology

Department of Computer Science and Engineering

Course No. : CSE4238
Course Name : Soft Computing Lab

Assignment No. : 02

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Section : A (A1)

My ID is 170104020. It is even ID. That's why I need to download the Dataset A.

In dataset we saw that this is Bangla Hand Written digit. After extracting the dataset, we can saw that there are two files. One is train training-a folder training-a.csv. In folder we see all the image. training-a.csv file have the information of the image.

Here, I am going to use this dataset and also I will use some hyperparameters. Then I am going to show some tables so that I can make some comparison among the experiments with the help of some graphs.

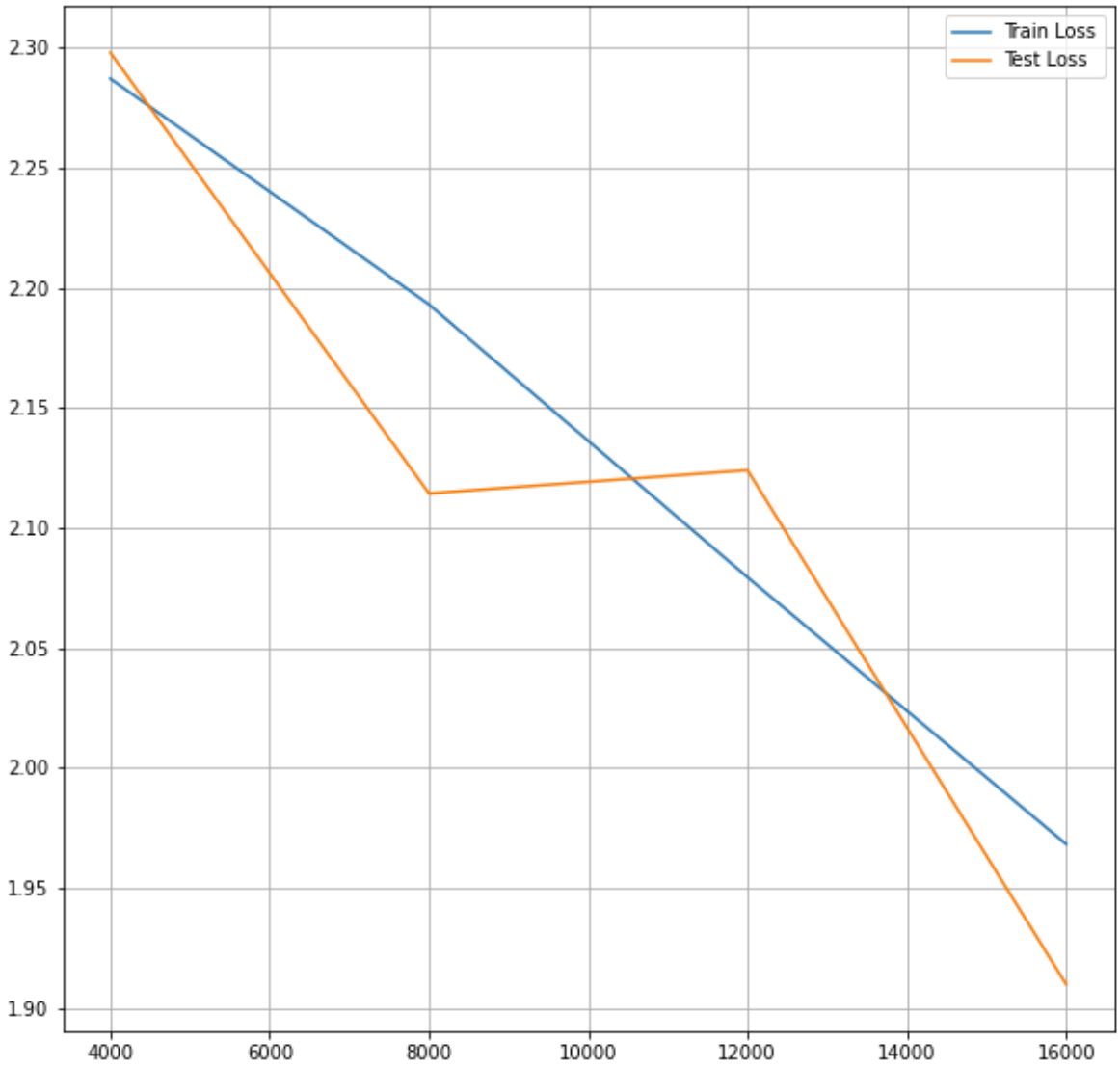
For training the mode. I use 4 basic flows.

1. Load dataset
2. Hyper parameter and variables
3. Model Creation
4. Model train

In model creation I divide into 2 parts first one is the model class creation and other one optimizer & criterion. I have used Stochastic Gradient Descent (SGD).

Experiment 1 (a)

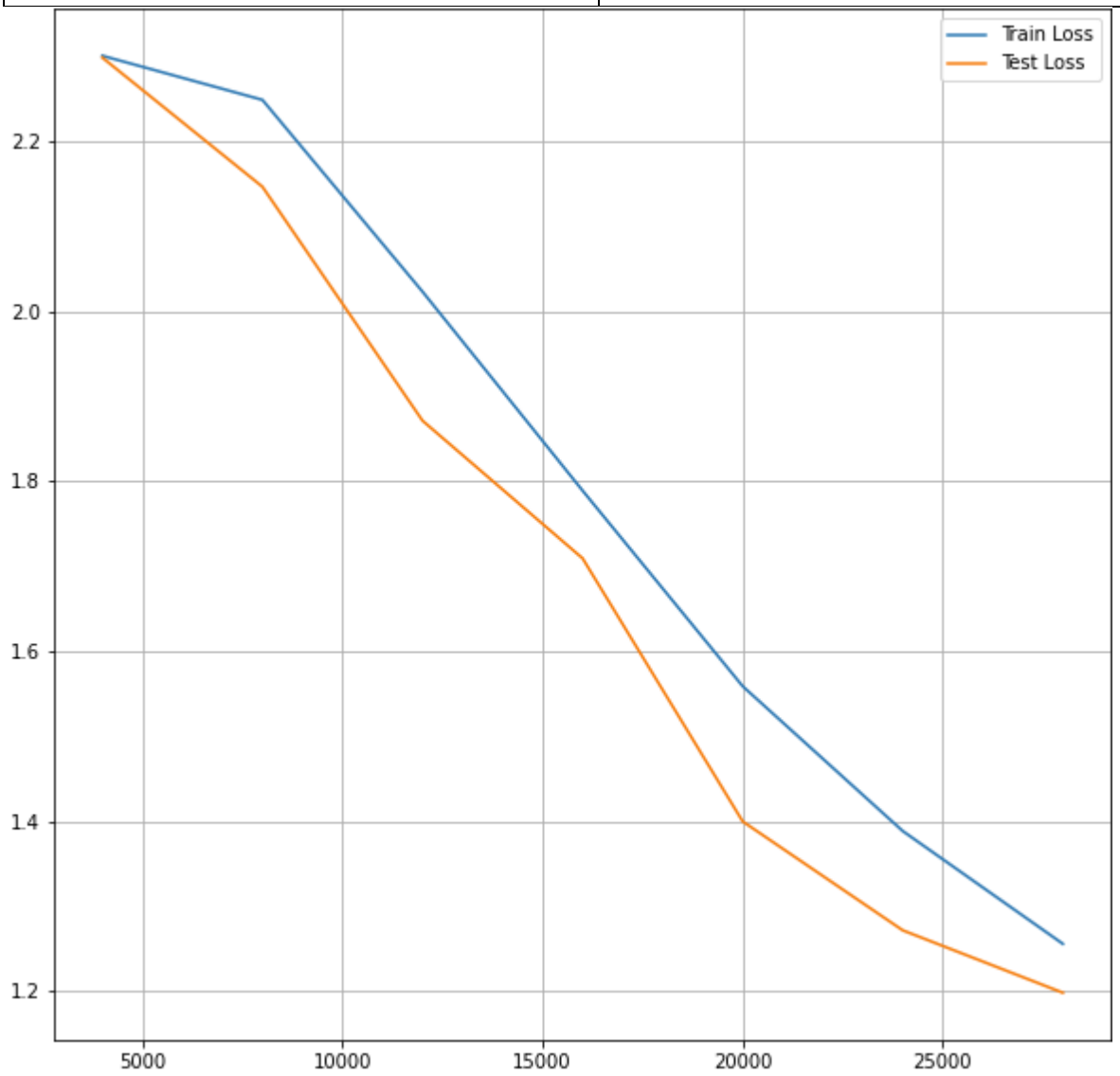
Name	Values
Total dataset	19702
Number of hidden layers	6
Number of nodes in hidden layers	200
Epoch	25
Learning rate	0.01
Batch size	20
Activation function	SGD



Accuracy found: 37%

Experiment 1 (b)

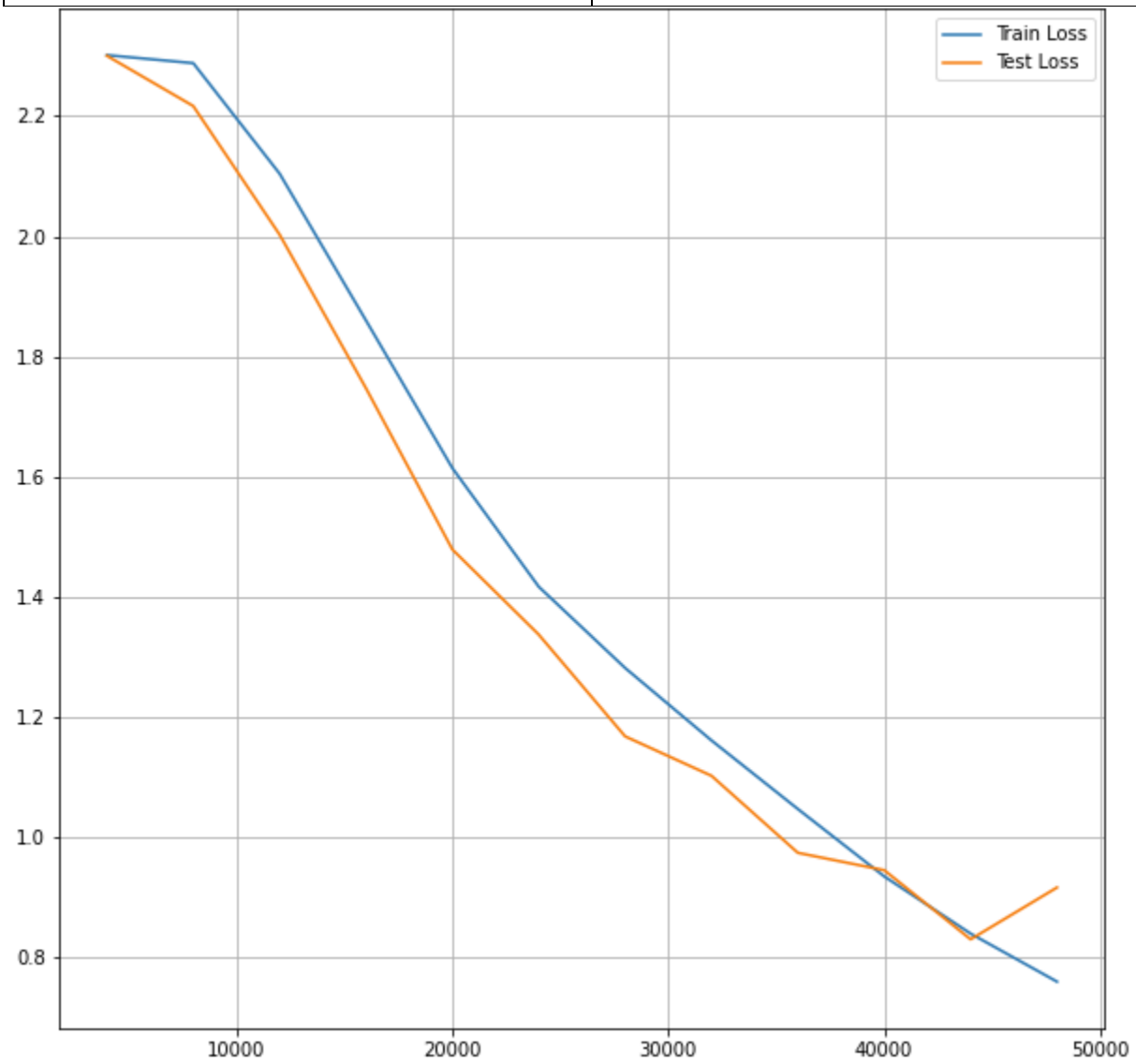
Name	Values
Total dataset	19702
Number of hidden Layers	6
Number of nodes in hidden layers	200
Epoch	
Learning rate	0.001
Batch size	32
Activation function	SGD



Accuracy found: 63.2%

Experiment 1 (c)

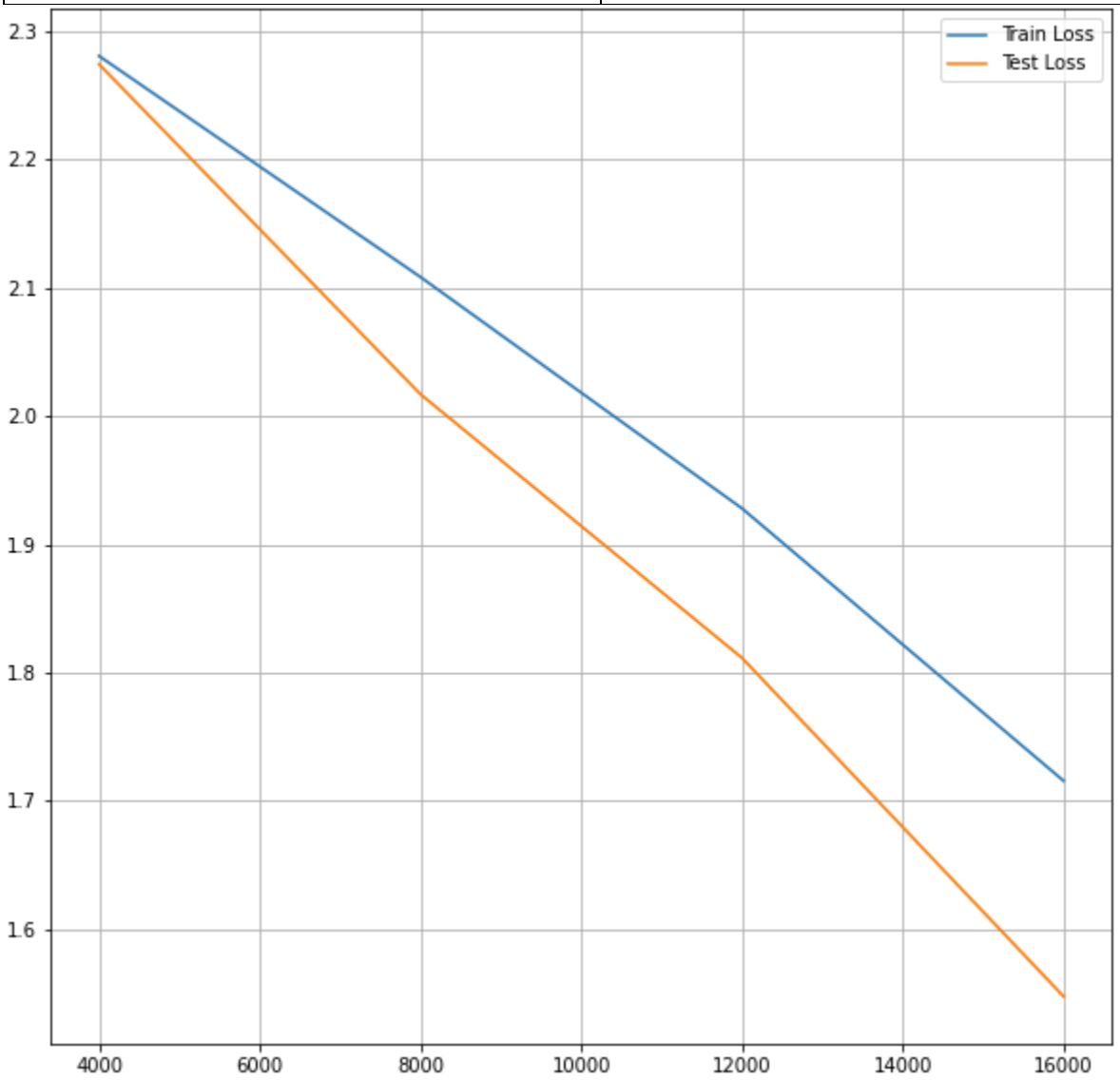
Name	Values
Total dataset	19702
Number of hidden layers	6
Number of nodes in hidden layers	200
Epoch	100
Learning rate	0.001
Batch size	32
Activation function	SGD



Accuracy found: 68%

Experiment 1 (d)

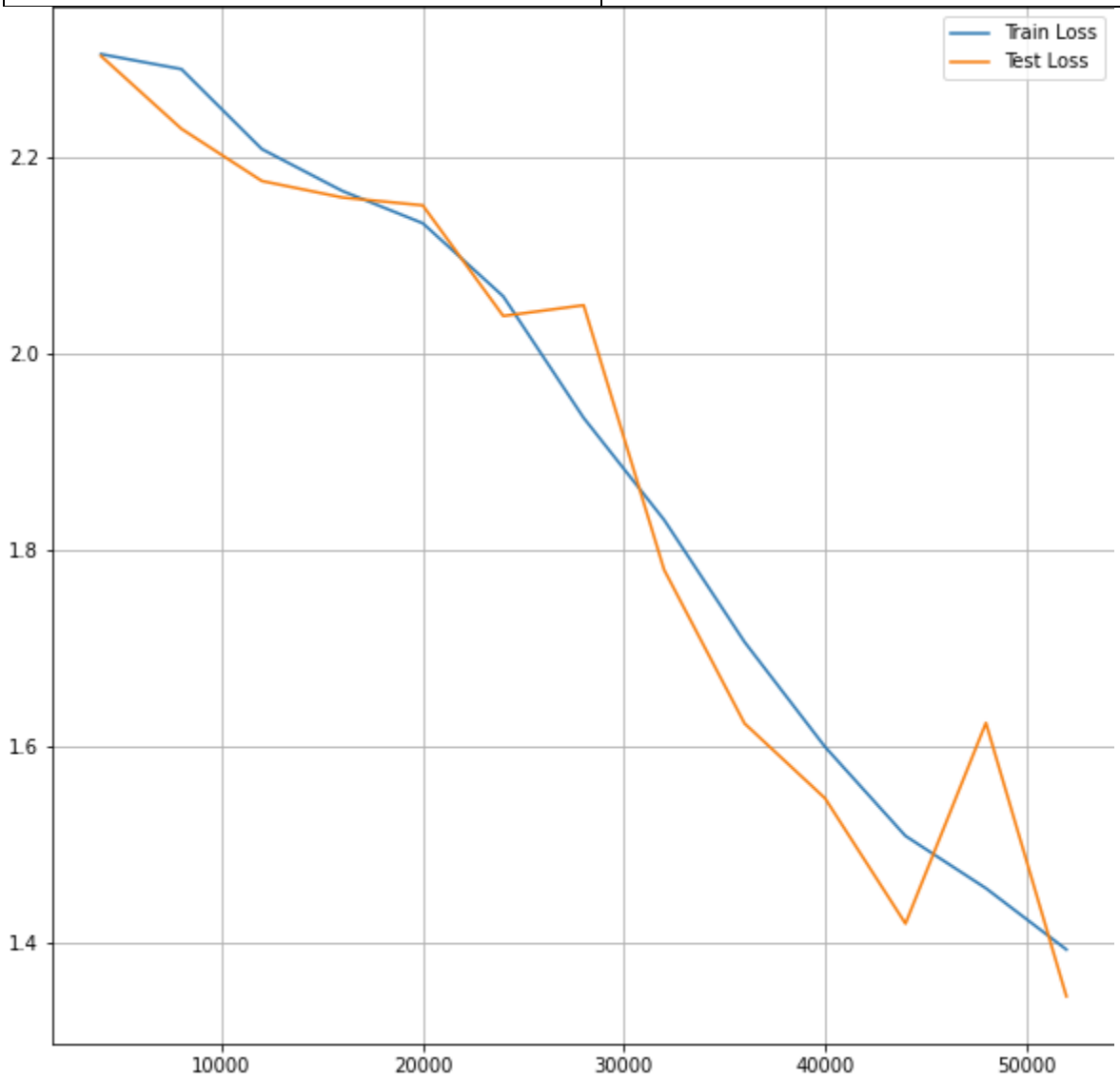
Name	Values
Total dataset	19702
Number of hidden layers	6
Number of nodes in hidden layers	300
Epoch	30
Learning rate	0.02
Batch size	30
Activation function	SGD



Accuracy found: 44.6%

Experiment 1 (e)

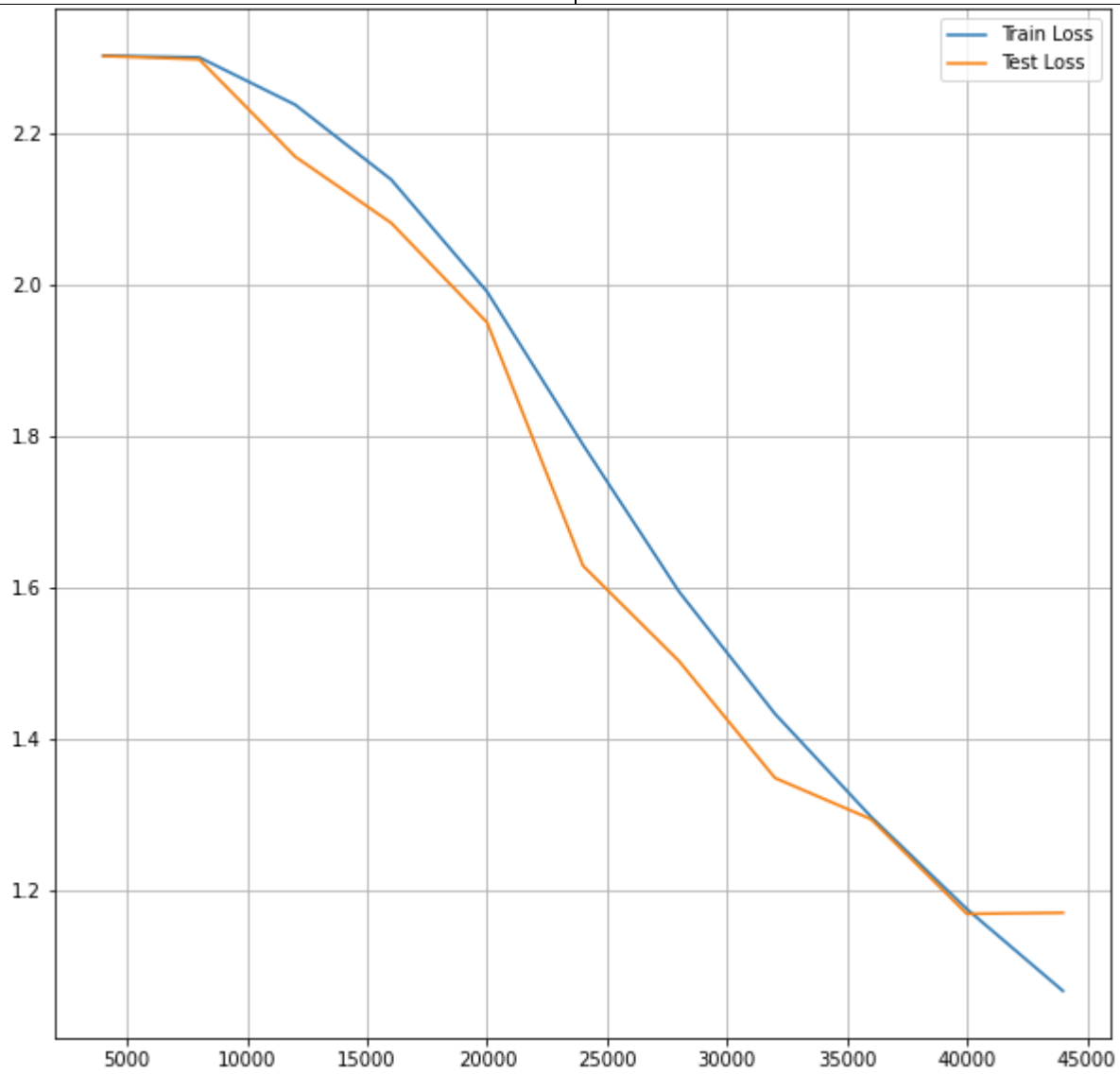
Name	Values
Total dataset	19702
Number of hidden layers	7
Number of nodes in hidden layers	350
Epoch	50
Learning rate	0.01
Batch size	15
Activation function	SGD



Accuracy found: 54.5%

Experiment 1 (f)

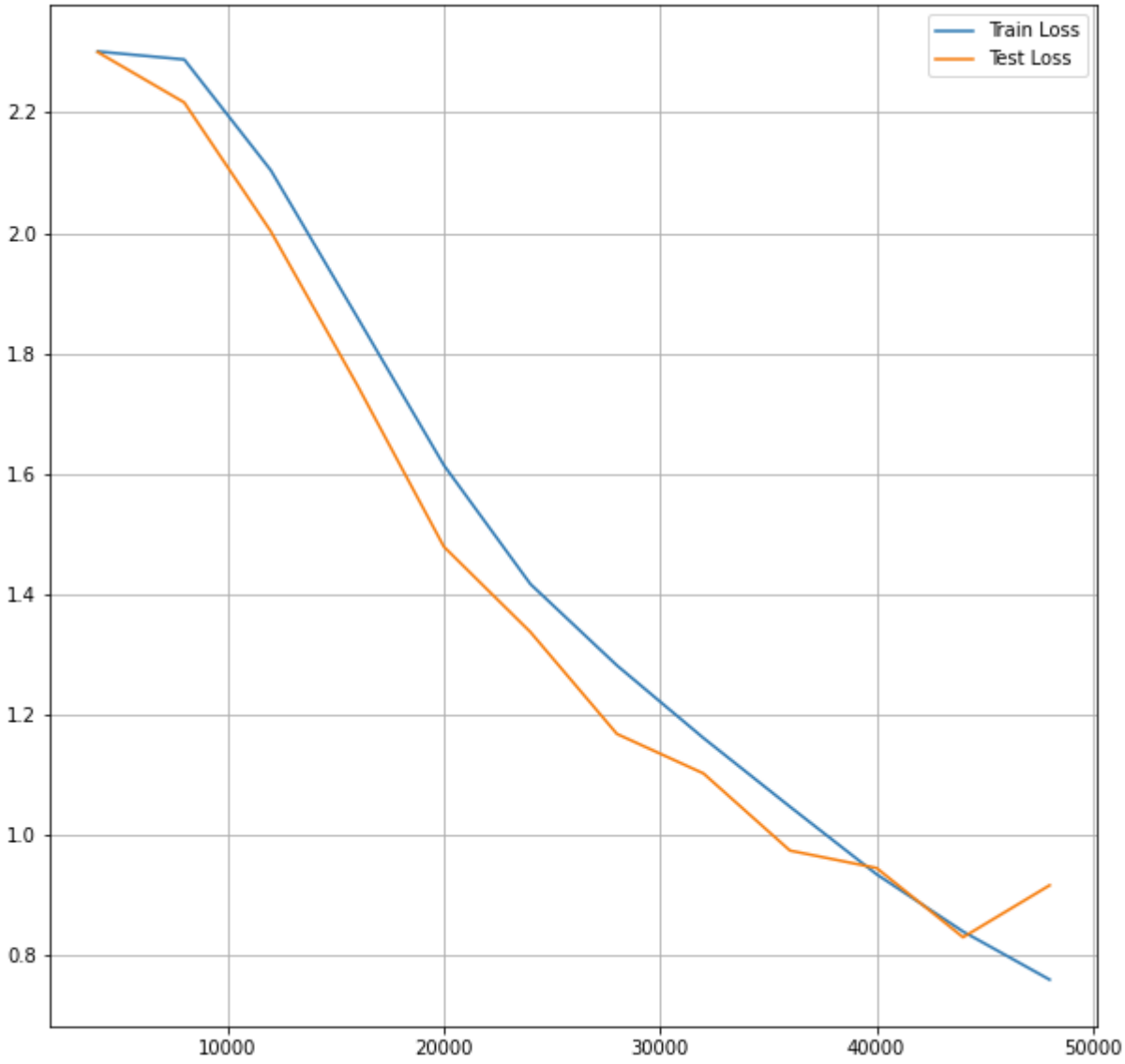
Name	Values
Total dataset	19702
Number of hidden layers	7
Number of nodes in hidden layers	200
Epoch	90
Learning rate	0.001
Batch size	32
Activation function	SGD



Accuracy found: 64.5%

Experiment 1 (g)

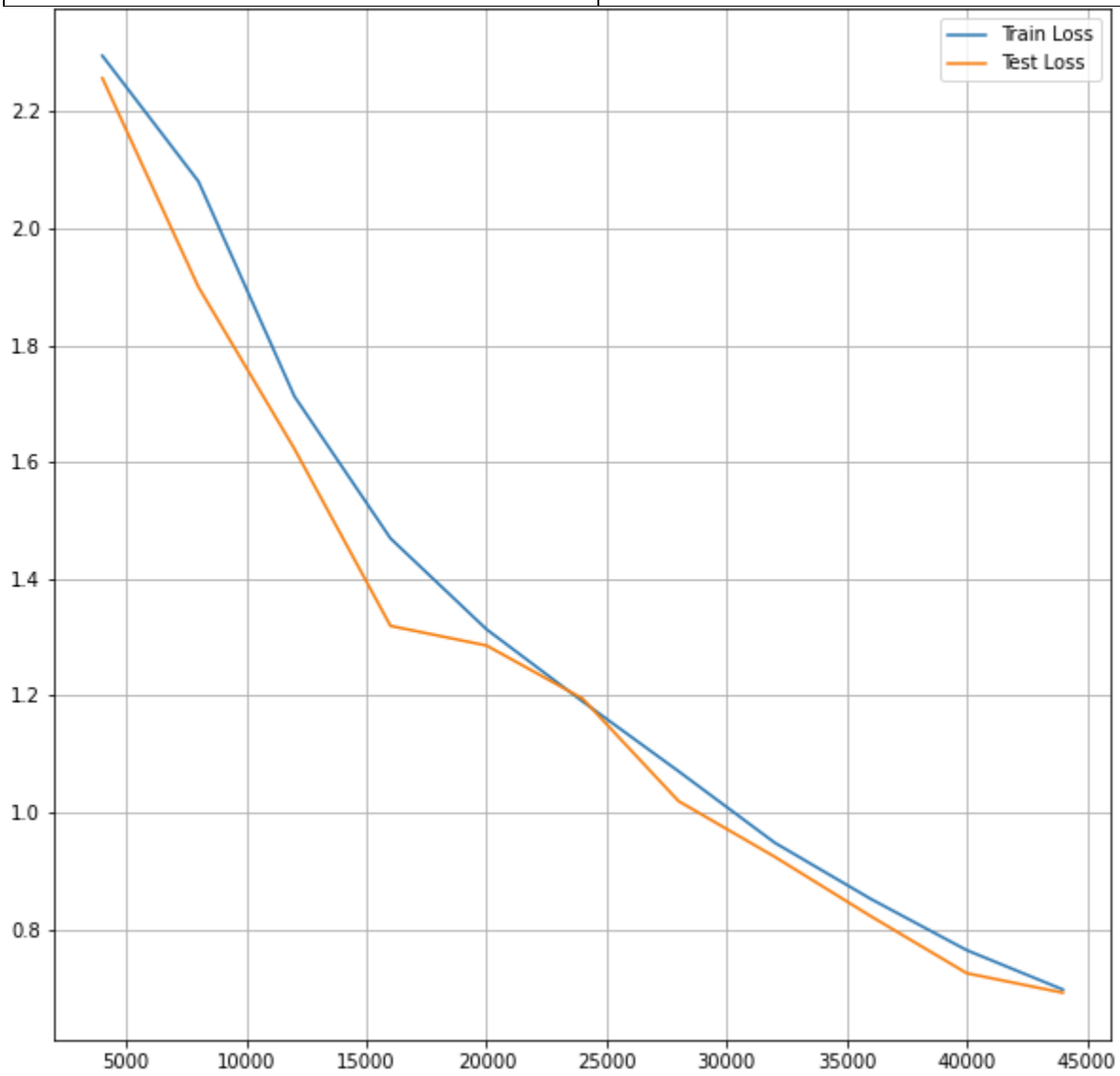
Name	Values
Total dataset	19702
Number of hidden layers	6
Number of nodes in hidden layers	200
Epoch	100
Learning rate	0.001
Batch size	32
Activation function	SGD



Accuracy found: 73.6%

Experiment 1 (h)

Name	Values
Total dataset	19702
Number of hidden layers	5
Number of nodes in hidden layers	200
Epoch	90
Learning rate	0.001
Batch size	32
Activation function	SGD



Accuracy found: 77.3%

So, we can see that among all the experiments, the experiment 1(h) has the highest accuracy value which is 77.3%.

I have noticed some important things here doing all the experiments. Accuracy value was increasing by increasing the epoch value which was increased to 90 and by decreasing the learning rate value which was decreased to 0.001. Also, accuracy value increased when I increased batch size which was increased to 32. Accuracy slightly increased when I decreased 1 hidden layer from 6 to 5.

I have done total 8 experiments. Among them 77.3% accuracy was the highest value which can be found in experiment 1(h).

GitHub repo: https://github.com/Swaad/170104020_exp_1.git