

CSE 4238 - Soft Computing Lab

Assignment # 02

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In this assignment, you will learn how to work with deep neural networks. There are two parts -

- I. Coding Part
- II. Report Writing Part

Here, each part contains individual marks.

I. Coding Part

1) Dataset

Find your *first* dataset of your task according to the following table. You will get a zip file. Drop all columns except 'filename' and 'digit' from csv file.

Criteria	Download Link
Even ID	Dataset A
Odd ID	Dataset C

2) Model Creation

Experiments:

There are *two* experiments on the first dataset which will be as follows. You have to find the accuracy and make predictions for each experiment. Keep 20% data for testing purposes from your dataset.

Hyperparameter	Experiment # 01	Experiment # 02
Number of hidden layers	6	Make necessary adjustments to increase the accuracy of Experiment # 01 upto 85% or more. You must show all approaches you try. Remember that your approaches and
Number of nodes in hidden layers	200(for all layers)	
iteration	20000	
Learning rate	0.01	

Batch size	20	results <i>must not be the same with others.</i>
Activation function of hidden layers	Choose an activation function as your own and apply it for all hidden layers.	
Optimizer and Loss	Set as your wish	

3) Checking Your Models' Performance by Another Dataset

You have to check both of your models'[i.e. Experiment # 01 and Experiment # 02] performance by using a second dataset [[Click here to download](#)]. Make necessary adjustments for the dataset if needed. Observe the results if they vary from the first dataset's results.

II. Report Writing Part

01. Add a cover page.
02. Make necessary tables to show the comparison between two experiments for the first dataset and discuss them.
03. Show the Loss vs Iteration graph.
04. Make a comparison of the results between the first dataset and second dataset by tables/graph/charts. Then discuss the results of those if they vary. Discuss the reasons behind them.
05. Upload your code in Github and share the link in your report.

Notes:

1. The report doesn't have any page limit.
2. Use any formatting tool latex/word/google doc to prepare your report.

Additional Guidelines:

- ★ Use Google Colaboratory to complete the coding part.
- ★ Use the Pytorch library for implementation. You can follow the lab materials if you need.
- ★ Write the report by following the instructions of the Report Writing Part.
- ★ Submit the report as pdf format by renaming it with your ID. *Example: 170104000.pdf*
- ★ Submit your codes as ipynb format by renaming it with your ID_exp_no. *Example: 170104000_exp_01.ipynb.*

- ★ If you have multiple .ipynb files for experiment # 02, rename them as *170104000_exp_02_1.ipynb* and so on.
- ★ Keep patience if it takes longer training time.
- ★ Submission deadline : **11: 59 PM, 28 August, 2021**
- ★ **All of your assigned tasks must be unique. Plagiarism is strictly prohibited and punishable.**