

Indian Institute of Science

E9: 253 Neural Networks and Learning Systems - I

Instructor: Shayan Srinivasa Garani

Mid Term Exam, Fall 2020

Name and SR.No:

Instructions:

- There are four main questions. None of them have negative marking.
- Attempt all of them with careful reasoning and justification for partial credit.
- There is absolutely no collaboration with any one or referring to any code from the web except referring to the web/class notes or text for any source of conceptual information you may need. You should not refer to any solutions if there are any. Cite all the resources used.
- This exam is assigned on 07/12/2020 at 6 am. and to be turned in by Thursday 10/12/2020 11:59 pm. This is a hard deadline.
- Do not panic, do not cheat, good luck!

| Question No. | Points scored |
|--------------|---------------|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| Total points | |

PROBLEM 1: A student claims that shuffling data will always help improve online and batch mode perceptron learning. Justify if the claim is true or false. (10 pts.)

PROBLEM 2: Solve problem 4.14 from S. Haykin (3rd edition, hard copy edition).

(20 pts.)

PROBLEM 3: For the Iris data set you worked in the second homework, based on the derived solution, show the working of the multiclass regression model by training with 80% of the data samples and choosing the rest for testing. What were your model parameters? What was the training/testing accuracy? You may want to use any cross validation strategies as appropriate. Discuss your results. (30 pts.)

PROBLEM 4: Solve problem 4.17 from S. Haykin (3rd edition, hard copy version).

(40 pts.)