ELL 784: Machine Learning, Assignment 1
Due Date: August 21, 2024, 11:59pm

Assignment-1:

1. Generate all possible boolean functions for 'n' inputs where $n \in \{1,2,3,4\}$.

2. How many of these functions are learnable by a L-layer ANN for $L \in \{1,2,3,4\}$?

3. Implement the backpropagation algorithm for an L-layer ANN.

4. Train your ANN for the classification of handwritten images in the MNIST dataset (0-9). Plot and report the loss functions and accuracies for training and the test set.

Notes:

- You should submit your code as a zip file (links directing to the code will not be evaluated).
- Include a report (pdf) file that includes a brief description of each question, explaining what you did. Include any observations and/or plots required by the question in this report.
- We plan to run a PLAG test for suspicious submissions. Any cheating will result in a zero on the assignment, a penalty of -10 points, and possibly much stricter penalties (including a fail grade and/or a DISCO).
- This assignment is supposed to be done individually.