

# AI6104 — Mathematics for AI

## Assignment

- 1) Design a neural network. (30%)
  - a. Using a figure to illustrate your neural network.
  - b. Specify functions, e.g. ReLU in the neurons
  - c. Specify an objective function, e.g. L2 norm to train the network.
- 2) Derive gradients for all the network parameters. Please write down each step clearly and highlight your final answer. (50%)
- 3) Apply the results in (1) and (2) and derive the training equations based on gradient descent. (20%)
- 4) The page limit of the report is 5.

Marking scheme:

- Correctness of each step.
- Complexity of the network and objective function.
- Presentation and writing.

Deadline of the submission: 21 Nov, 11:59pm.

References: Lectures note 4 and 5 and tutorial 6. An example is given in lecture note 4, page 29 (The gradient of neuron activation) and lecture note 5 page 57 (Gradient Descent).