Department of Data Science
IIT Palakkad
CS5007 : Deep Learning

1400-1450 **Quiz 2 (18 Feb 2022)** **Marks : 10**

Instructions

1. Write your answers neatly in Blue/ Black ink. Do not use pencil / Red ink. If your answer is not legible, you will not get any marks for that.

2. Doubts and questions will not be answered during the exam. If you have to make any assumption about unspecified things, write the assumption clearly with justification.

3. Answer all parts of a question together. If the parts of a single question are not together, then only the first part will be evaluated. Other parts will not get any marks.

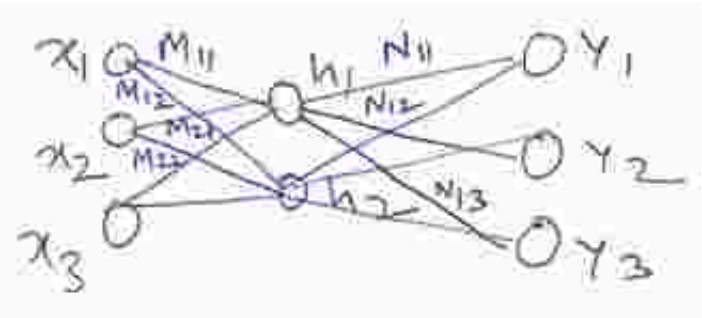
4. Write your name and ID number at the top of the answer sheet. Save the pdf with the following naming convention: [name]_dl22_quiz_1.pdf and upload to the designated assignment in LMS. Do not email.

5. Write question number clearly for each answer. Draw a line after the answer.

6. No hard or soft material are permitted for consultation during the exam.

7. There will be partial markings for the questions, so even if you are not able to solve the entire problem be sincere with the steps.

1. The dataset is as follows: $\{[x_1 = (0,0,1), t_1 = (0,1,0)], [x_2 = (0,1,0), t_2 = (1,0,0)], [x_3 = (1,0,0), t_3 = (0,0,1)]\}$. You have to train the following network with this dataset. (10)



Initial values for the weights are as follows: $\{M_{11} = 0, M_{12} = 1, M_{21} = 1, M_{22} = 0, M_{31} = 1, M_{32} = 1\}$, $\{N_{11} = 1, N_{12} = 2, N_{13} = 3, N_{21} = 3, M_{22} = 2, M_{23} = 1\}$. The bias terms for the hidden nodes h_1, h_2) are respectively (2,-2), and ReLU is the activation function at the hidden layer.

a. Work out the forward propagation for all input data points. Show the intermediate values at each step. [3]

b. Which weight value will get maximum changed after the first iteration ? You can choose your loss function and output function, but specify them with justification. [3]

c. What could be a better initialization ? [2]

d. If this model is used for representing words as vectors, then what will be the initial set of vectors ? [2]
