

## Homework 3, Due 11:59 p.m., April 26

CAPP 30255

- You are encouraged to discuss with other students. But **you should not directly copy their solutions**, and never submit anything you don't fully understand. Further, you should **name the students** you discussed with, on top of the first page of your submission.
- 1. (10 points) Draw a neural network, using the sigmoid non-linearity, which has four Boolean inputs and the output is 1 if the number of inputs set to 1 is either 2 or 3, and is 0 otherwise (i.e., if the number of inputs set to 1 is in  $\{0, 1, 4\}$ ).  
Assume a neuron outputs 0 if the input to the sigmoid is at most  $-4$  and outputs 1 if the input is at least 4. Specify the weights and the biases of each neuron clearly.
- 2. (90 points) Build a neural network-based part of speech tagger. The accompanying notebook has code to get you started and details on the 8 tasks you have to complete.

Submit your solutions to **Gradescope**.