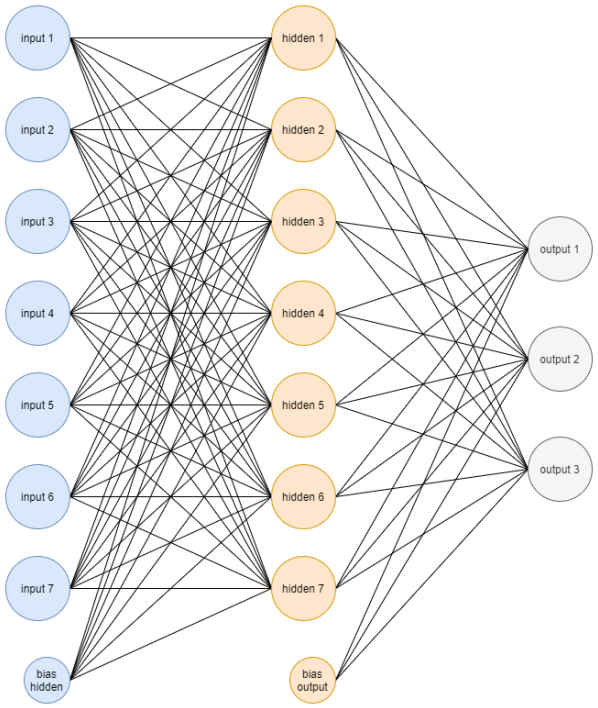
Yeshiva University

AIM 5007 Neural Networks and Deep Learning
Mini-Project 2

Instructions

In mini-project 1, you trained a model for the following architecture using the seeds data. In this mini-project, we will explore some changes to our model and how they impact the result. This mini-project is more exploratory than the last and gives you a bit of freedom to choose which changes to make. I will offer some suggestions below.



As before, the data set can be found here:

https://archive.ics.uci.edu/ml/datasets/seeds

For this assignment, take the original model and make three changes to it, one at a time. You will end up with three results. Make sure you do not make all three changes at once. (You may, however, make a change, obtain a result, and then make the next change while keeping the original change. You may also make a change, obtain a result, and then go back to the original and make a different change.)

Your final submission will be a report that describes the changes you made and how that affected the result. For instance, did you get a more accurate model? Did it train faster? This is your chance to explore a bit and start to understand how your choices affect the results you obtain. We will do more of that on coming assignments as well.

Possible Experimentation Ideas

Here are some suggestions for things to try (and my estimation of the difficulty):

- (Easy) Change the learning rate and see how that affects both the result and the speed of convergence. I would suggest trying several different values and seeing what happens.
- (Moderate) Change the activation function. You might try the hyperbolic tangent function or the RELU function here. I can assist with the gradient formulas for these.
- (Moderate) Change the network architecture so there are fewer nodes in the hidden layer. What happens if you use three nodes? Five? Try a couple different values.
- (Hard) Change the network architecture so that you have more than one hidden layer.

You might have another idea. If so, feel free to use it so long as you can show that you've learned something from it!

Your report should include a summary of each experiment you perform and what it taught you. You should also submit your final python code.

I would encourage you to work together on this project. If you do so, you should each produce your own summary report, but the code can be shared. Just make sure to tell me you worked together!

Grading Rubric

0-4	Clarity and correctness of summary explanation and conclusions
0-2	Organization (easy to follow, well structured, good, concise comments in the code, etc.)
0-4	Correct code that runs for me when I verify it