Pattern Recognition and Machine Learning
(Winter 2022)
Assignment 10: Neural Networks

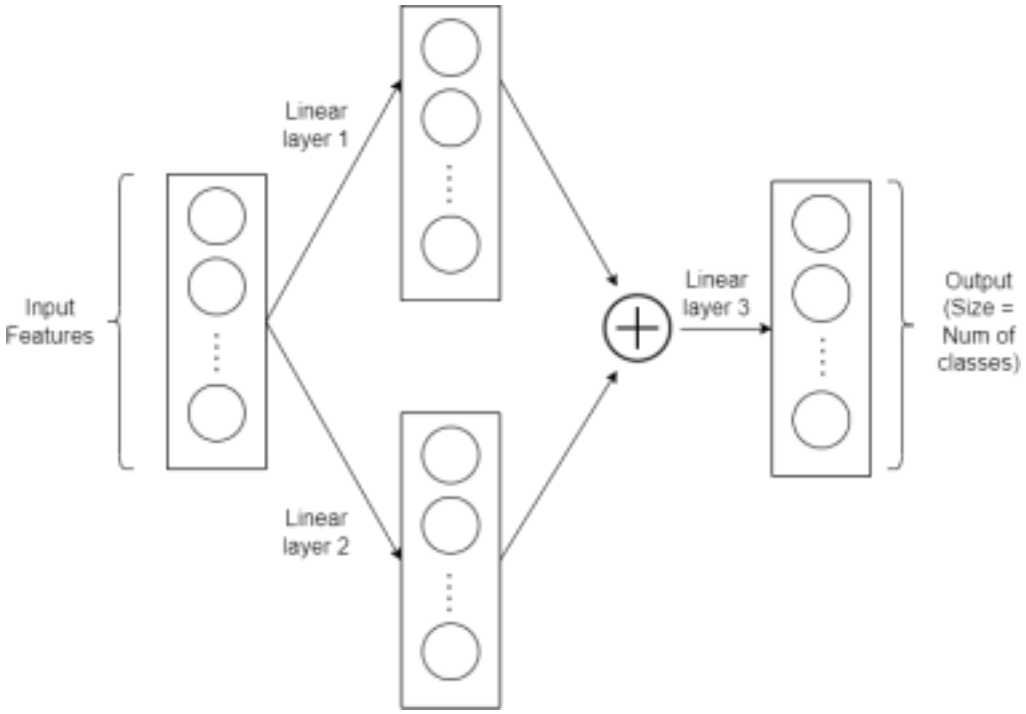
Deadline: **March 20th, 2022 23:59**

Guidelines for submission

1. Perform all tasks in a single colab file.
2. Create a report regarding the steps followed while performing the given tasks. The report should not include excessive unscaled preprocessing plots.
3. Try to modularize the code for readability wherever possible
4. Submit colab file [.ipynb] and report [.pdf] on the classroom (without zipping)
5. Submit the [.py] file on the floated form for the lab
6. Plagiarism will not be tolerated

Question 1. [20]

In this exercise, you need to predict the life of *Abalone* - a kind of shellfish, based on a number of characteristics (sex, length, diameter, height, weights in different forms, etc.). Model it as a classification problem to predict the class (based on the number of rings). The dataset is available here. You need to use the PyTorch library to create a neural network with the following specification, split the data and find out the accuracy on the test set after training:



Decide on the hidden layer size on your own. Use sigmoid activation for the output layer and tanh for the hidden layers. The '+' Symbol represents the addition of the outputs of the 2 branches.
Note: You can refer to the Colab file shared on the classroom (link) for sample code.

(It is a shared file so refrain from making changes in it.)

Guidelines for the report

1. The report should be to the point. Justify the space you use!
2. Explanations for each task should be included in the report. You should know the '*why*' behind whatever you do.