COMP4660/8420 Lab 3

Neural Networks Adv.

**Q1. Use pseudocode to describe the backpropagation learning algorithm and how it works**

**Q2. For the neural network shown in Figure 1, with sigmoid activation functions for both the hidden and output neurons and a squared error loss function, perform one pass of backpropagation and calculate the new weights. Assume the target is 1 and the learning rate is 1.**

0.4

0.3

0.9

0.1

0.8

0.6

0.3

0.9

***Figure 1.* A multilayer feedforward neural network**

A

wAB

wAC

B

C

Hint:

Loss function:

Output error:

Calculate new weights:

Hidden layer error:

# Programming Task - Using PyTorch for Regression

In this lab, you will build a model to perform regression using PyTorch. The script given is an example of building a regression model using PyTorch. It aims to build a regression model for y = 3x + 3.

## Task

Your task now is to construct a regression model for the Wine Quality data set: <https://archive.ics.uci.edu/ml/datasets/Wine+Quality>

Familiarise yourself with the data set and perform any pre-processing or normalisation needed. Use PyTorch to implement a regression model for the wine quality dataset and find the average error of predictions. Work on making your predictor as accurate as possible.

**Q1. How does regression differ from classifications?**

**Q2. What does your output look like?**

**Q3. Where should you define your regression model?**

**Q4. In the previous tasks we were calculating misclassification error. What error value might you use for a regression task?**