Assignment 5 : Neural Network

**Exercise 02:** In your written response compare the result #1 to result #2 to the actual result explain your findings.

Analysis:

The Actual result of sum should come 0.3 (0.1 + 0.2). But, exercise 1 predicted the result as 0.3534 while exercise 2 predicted 0.2802

However, both are close to the actual result but did not reach their exact goal i.e. 0.00001.

So, we can say that result\_01 is less accurate than result\_02 if we compare it with the actual result for several reasons.

Firstly, there are two hidden layers in the 2nd network with fewer epochs = 200.

Secondly, a training algorithm for Gradient descent backpropagation is used.

These changes help the multi-layer model to predict more accurate reasons than the single-layer model.

**Exercise 03:** In your written response compare result #1 to result #3 to the actual result explain your findings.

Analysis:

The Actual result of sum should come 0.3 (0.1 + 0.2). But, exercise 1 predicted the result as 0.3534 while exercise 3 predicted 0.3039.

However, both are close to the actual result but did not reach their exact goal i.e. 0.00001.

Both exercises consist of one hidden layer. But exercise 3 has 100 random numbers whereas exercise 1 has only 10 random numbers.

Exercise 1 takes 15 epochs to reach this goal and exercise 3 takes 195 epochs to reach this goal.

Hence, The model with more training data can predict the data close to the actual result by keeping other values similar to other factors such as epoch, show, the goal in both the models.

**Exercise 4:** In your written response compare the result #3 to result #4 to the actual result, explain your findings.

Analysis:

Exercise 3 predicted the result as 0.3039 while exercise 4 predicted 0.4392.

If we compare both the results then the result for the single-layer neural network model with more training data is close to the actual result than the multilayer neural network model i.e. result of exercise 3 is more accurate.

Hence, If more data is used, the multi-layer model will take more epochs to predict good performance.

**Exercise 5:** In your written response compare the result #5 to result #6 to the actual result, explain your findings.

Analysis:

The Actual result of sum should come 0.5 (0.2 + 0.1 + 0.2). But, exercise 5 predicted the result as 0. 4197 while exercise 6 predicted 0. 5991.

We observe that If we compare both the results, then we can say that result of exercise 6 is more accurate than exercise 5.

So, the model with more training data can predict the data close to the actual result in both models.