DL/CV Assignment-0

RITIKA MUGUNDAN

2nd February 2020

1 Task 1

1.1 REQUIREMENT:

To observe the loss in the following conditions:

Change the size of hidden layer, hidden-size. Change the total number of epochs the model will run for, num-epochs.

1.2 OBSERVATIONS AND INFERENCES:

At hidden-size = 5 . the loss falls closest to zero and also more rapidly when compared to other values of hidden size. Though the loss value consistently drops for hidden-size equal to 4, 3, 2, it seems to be less effective. Same results were seen for hidden-size¿5. When size of hidden layer was set to 1, the loss barely decreased at all.

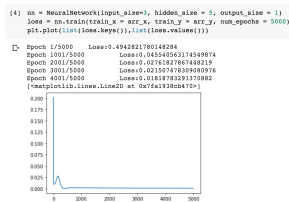So, the optimum size for hidden layer seems to be 5.

Figure 1:

Now, as the num-epochs increases, the final loss value keeps decreasing. If a certain threshold value is predetermined, the number of epochs can be can then be assessed accordingly. Say, if said value was set at 0.2, then num-epochs would be 4000. But when the num-epochs is set at a very small value, loss value remains very high, close to about 4.9.
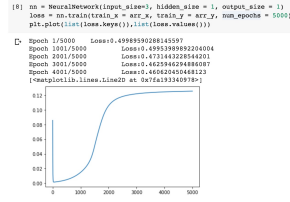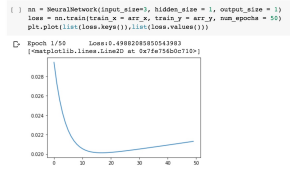
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Figure 2:

Figure 3:

2   Task 2

2.1   REQUIREMENT:

To use Tan-H and ReLU instead of using Sigmoid as the activation function

2.2   OBSERVATIONS AND INFERENCES:

When using tanh function, the loss value is observed to be very unstable and continuosly rises and falls with increasing number of epochs. This is the case even when the size of hidden layer is altered.
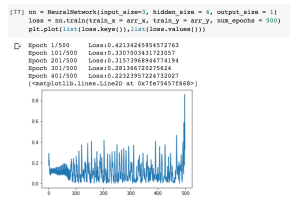

Figure 4:

When using the relu function, the loss value drops much more rapidly in very few iterations. But the final loss value seems to remain stagnant at 0.5 without much change after reaching this value.
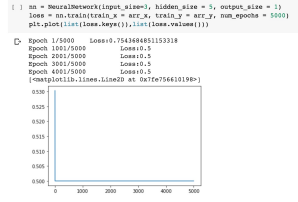
Figure 5:

3 Task 3

3.1 REQUIREMENT:

To generate the truth tables for the following logical expressions:

1. F = !((A.B)+C) + D

2. F = !(A.B) xor !(C.D)

3.2 OBSERVATIONS AND INFERENCES:

For these equations, since there are 4 variables and so more number of input - output cases, the training data size was increased. This has increased the accuracy of the model considerably. The loss value is very low and also drops down very quickly. The optimum hidden-size seems to be 7 or 8. For the same threshold value of 0.2, the num-epochs would be less than 1000.
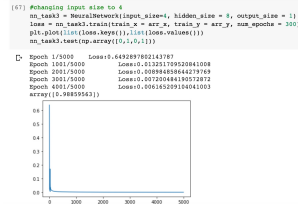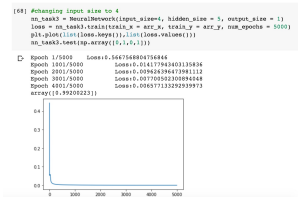

Figure 6:

Figure 7: