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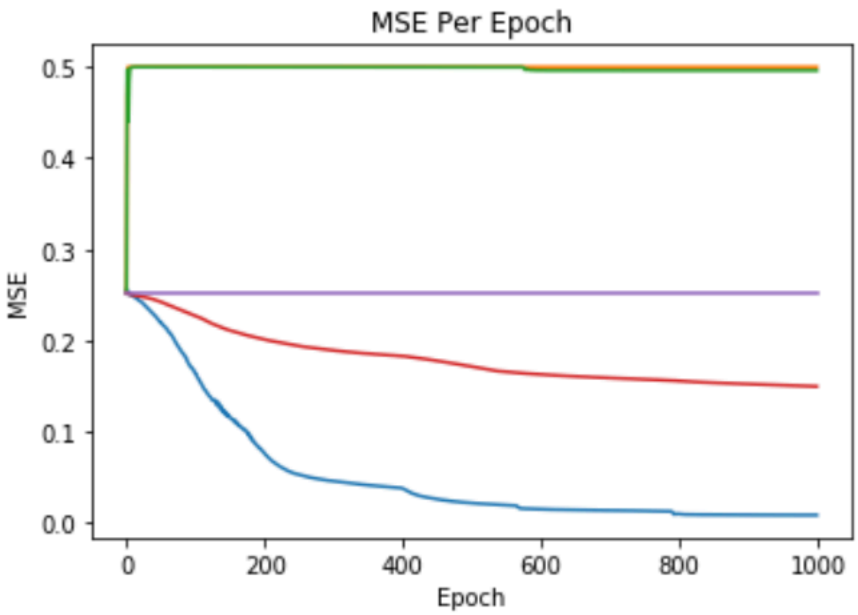
HW4
1 May 2020

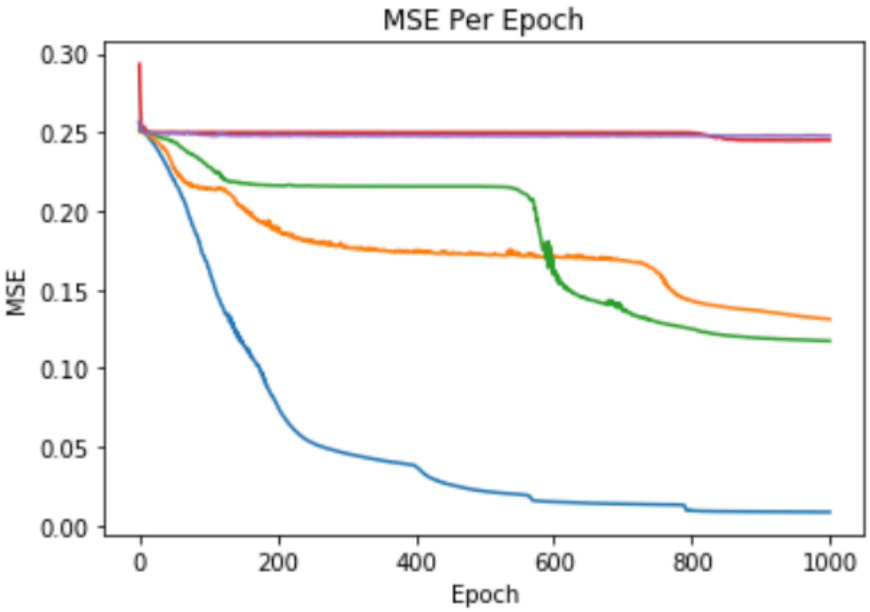
Feed Forward Tasks:

1. Graph of loss curve for 5 different learning rates
   - Blue: 0.03
   - Orange: 30
   - Green: 3
   - Red: 3e-3
   - Purple:3e-6

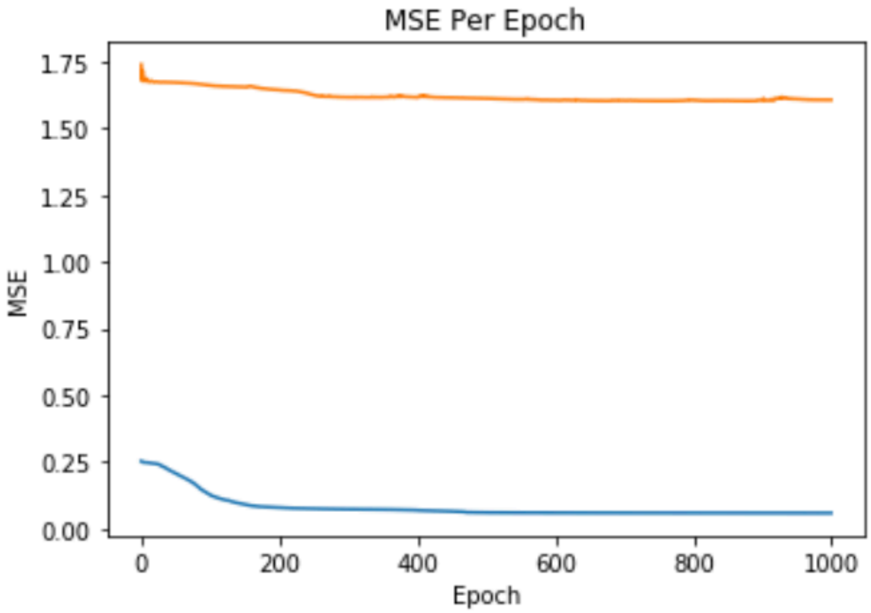


2. Graph of loss curve for 5 different numbers of hidden nodes
   - Blue: 16
   - Orange: 13
   - Green: 8
   - Red: 6
   - Purple:4

- It seems that at about half our original hidden_size layer, is the smallest the layer can be and still learn the function. When it is smaller than that, we get a flat line which looks like the red/purple line. When I tried it one 7, it would give results either like 8 or 6 so I decided the cutoff to be 8 or half.

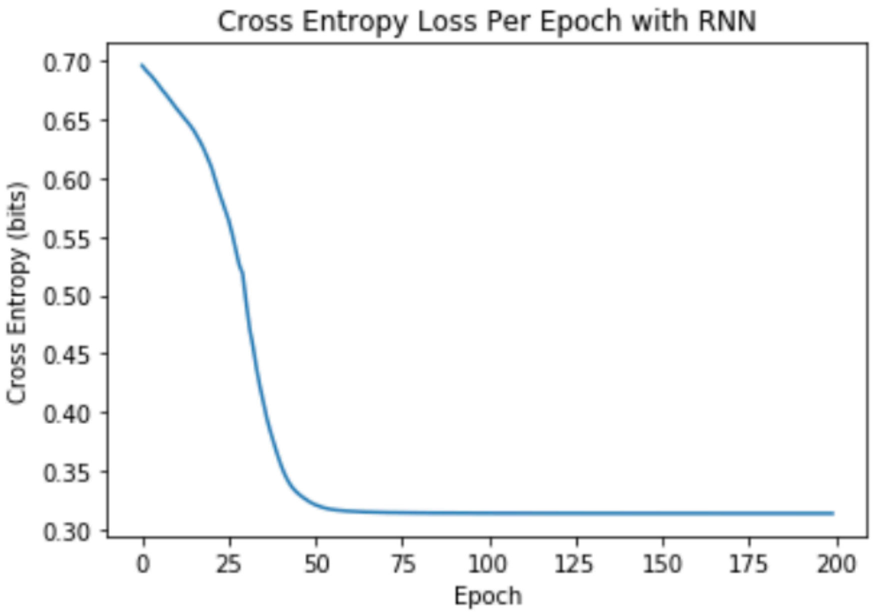


3. Graph of loss curve with an additional layer

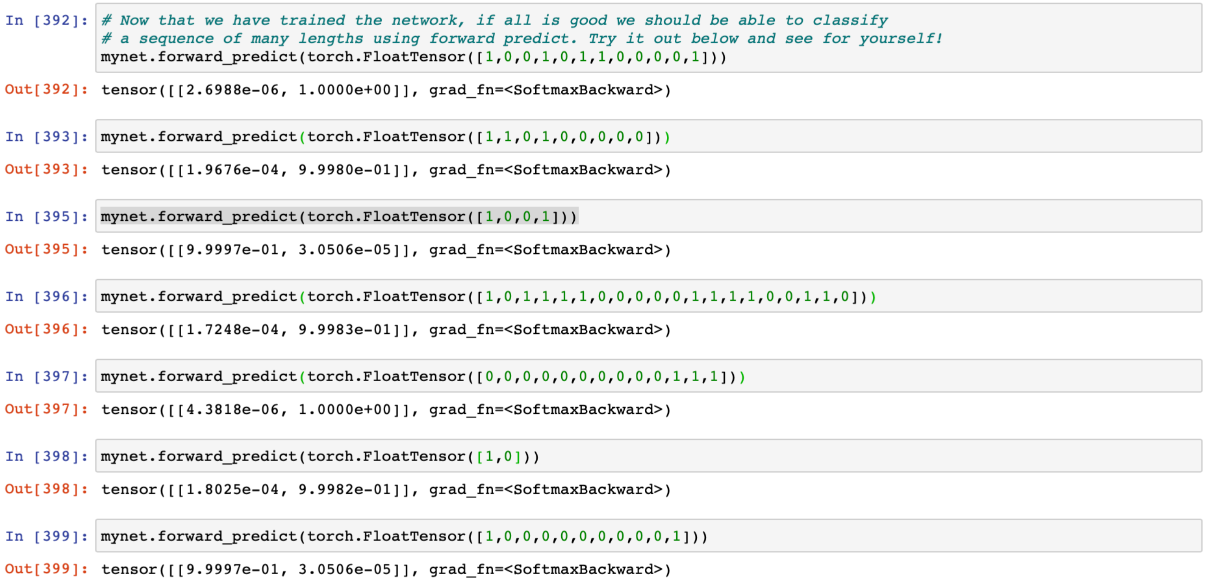


RNN Task:

1. The loss curve of your RNN



2. RNN classifying at least 5 sequences of different lengths



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In [392]: # Now that we have trained the network, if all is good we should be able to classify
          # a sequence of many lengths using forward predict. Try it out below and see for yourself!
          mynet.forward_predict(torch.FloatTensor([1,0,0,1,0,1,1,0,0,0,0,1]))

Out[392]: tensor([[2.6988e-06, 1.0000e+00]], grad_fn=<SoftmaxBackward>)

In [393]: mynet.forward_predict(torch.FloatTensor([1,1,0,1,0,0,0,0,0]))

Out[393]: tensor([[1.9676e-04, 9.9980e-01]], grad_fn=<SoftmaxBackward>)

In [395]: mynet.forward_predict(torch.FloatTensor([1,0,0,1]))

Out[395]: tensor([[9.9997e-01, 3.0506e-05]], grad_fn=<SoftmaxBackward>)

In [396]: mynet.forward_predict(torch.FloatTensor([1,0,1,1,1,1,0,0,0,0,0,1,1,1,1,0,0,1,1,0]))

Out[396]: tensor([[1.7248e-04, 9.9983e-01]], grad_fn=<SoftmaxBackward>)

In [397]: mynet.forward_predict(torch.FloatTensor([0,0,0,0,0,0,0,0,0,0,1,1,1]))

Out[397]: tensor([[4.3818e-06, 1.0000e+00]], grad_fn=<SoftmaxBackward>)

In [398]: mynet.forward_predict(torch.FloatTensor([1,0]))

Out[398]: tensor([[1.8025e-04, 9.9982e-01]], grad_fn=<SoftmaxBackward>)

In [399]: mynet.forward_predict(torch.FloatTensor([1,0,0,0,0,0,0,0,0,0,1]))

Out[399]: tensor([[9.9997e-01, 3.0506e-05]], grad_fn=<SoftmaxBackward>)
```