Riley Densley
HW 06
Intelligent Systems

| Convnet | Accuracy | Time (min) |
|---|---|---|
| 1 | 99 | 20 |
| 2 | 99 | 30 |
| 3 | 98 | 42 |
| 4 | 98 | 24 |
| 5 | 99 | 49 |

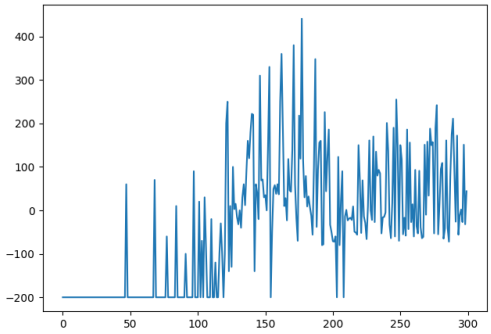
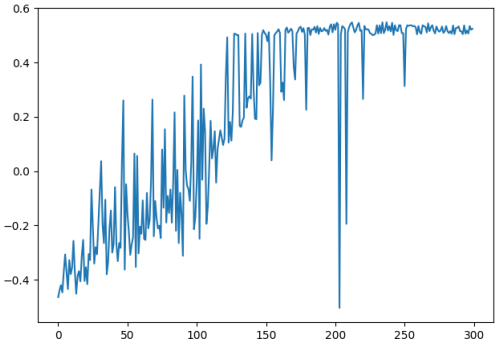
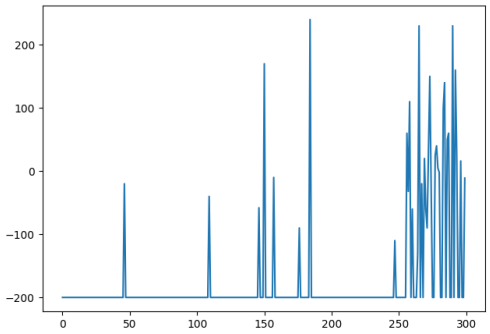
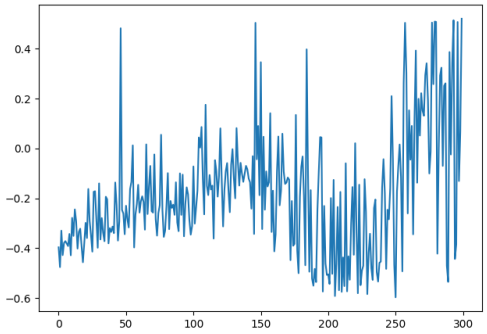
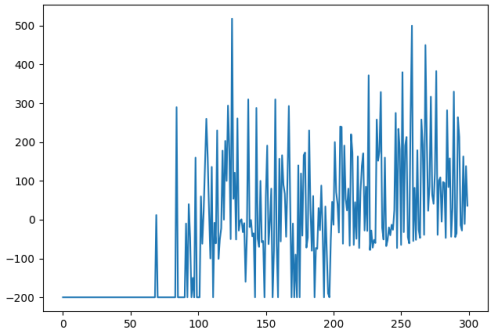
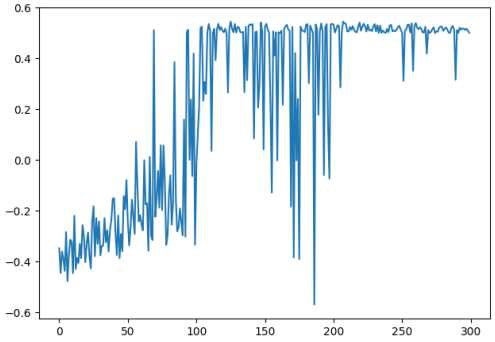
Problem 1: I think the convolutional neural nets are worth it I think. The accuracy was better then I had seen and any of the ANN I had made and it was able to be trained in a much shorter amount of time. The differences in accuracy and time didn't seem to be too affected by the use of rulu, tanh, and sigmoid. The only thing to note was that my fifth program used only tanh and it ran the slowest.

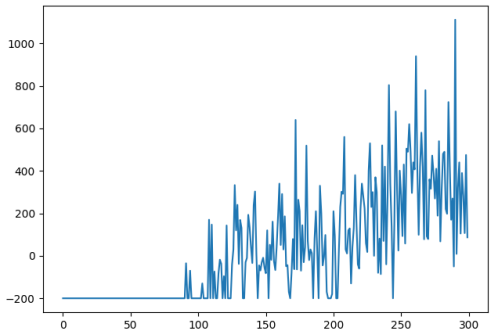
Problem 2: For my neural networks the highest reward I saw was over 1000. The neural network was getting the highest reward also had the most success in getting the car to finish at x = 0.6. This was done with 4 layers of 50 fully connected neurons.

My networks usually took over 100 epochs to get to a solution. Talking to other students they had networks that trained much quicker by changing the learning rate. I decided to not play with that and see how quickly the neural nets could be trained with different setups. My most unsuccessful neural net was a fully connected 2 layer net with 10 neurons each.

| FCNN | NN | Rewards | Max X |
|---|---|---|---|
| 1 | 2x50x50x3 | 400 | 0.6 |
| 2 | 2x10x10x3 | 250 | 0.5 |
| 3 | 2x100x100x3 | 500 | 0.6 |
| 4 | 2x50x50x50x50x3 | 1100 | 0.5 |
| 5 | 2x100x100x3 (tanh) | 900 | 0.5 |

Images below are rewards on the left and distance on the right, in order from 1 to 5.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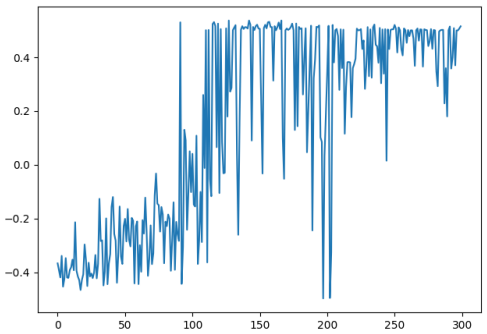
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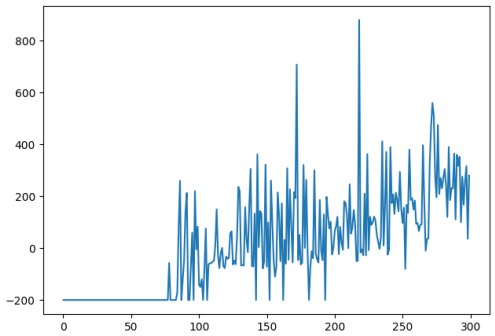
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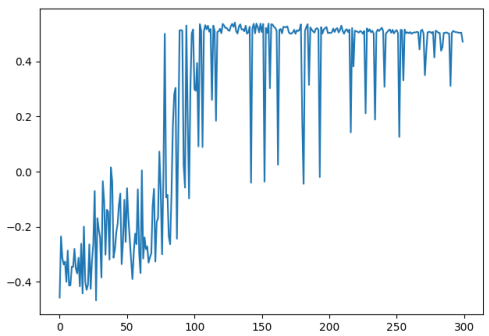
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