Assignment 1: Imitation Learning

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Collaborators: `Write the Andrew IDs of your collaborators here.`

1 Behavioral Cloning

1.1 Part 2

Environment	Eval Mean	Eval STD	Expert Mean	Accuracy
Ant-v2	1965.9	887.9	4713.6	41.7%
HalfCheetah-v2	3209.9	143	4205.7	76.32%
Hopper-v2	574.4	344.8	3772.6	15.23%
Humanoid-v2	304.9	37.5	10344.5	2.95%
Walker2D-v2	361.8	329.1	5566.8	6.49%

1.2 Part 3

I chose Walker2d as another environment since it's accuracy is less than 30% compared to Ant-v2.

Metric	Ant-v2	Walker2d-v2
Eval Mean	1965.9	361.8
Eval Std	887.9	329.1
Train Mean	4713.6	5566.8
Train Std	12.19	9.23
Train itr	1000	1000

1.3 Part 4

I tried to experiment with the number of layers of the MLP. As we can see the accuracy is increases when we increase number of layers. I chose this parameter since increasing number of layers will increase the non linearity and will make it easier for the network to learn. I did not make any changes in other hyperparameters.

Metric	Ant-v2 with 4 layers	Ant-v2 with 6 layers
Eval Mean	1965.9	2159.3
Eval Std	887.9	512.4
Accuracy	41.7%	45.8%
Train itr	1000	1000

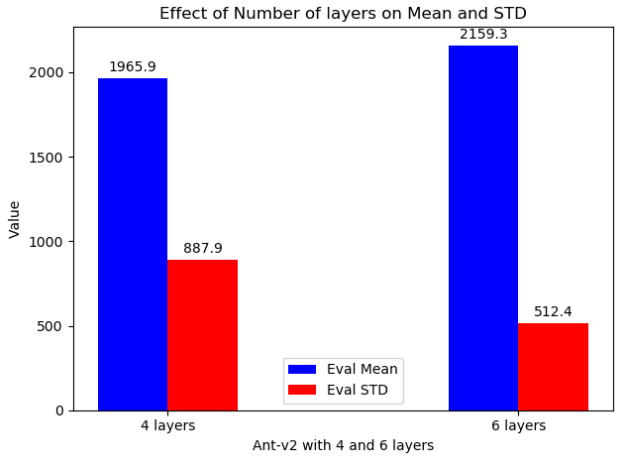

Figure 1: Effect of no of layer on Mean and STD in Ant-v2 environment.

2 DAgger

2.1 Part 2

I used 4 layers in the MLP for both the tasks and used the default hyperparameters for everthing else.

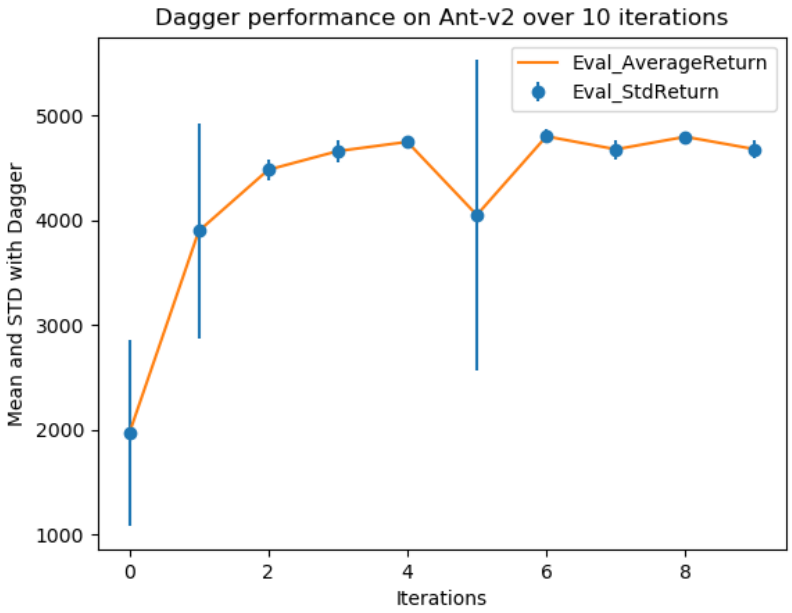

Figure 2: Dagger performance on Ant-v2 over 10 iterations.

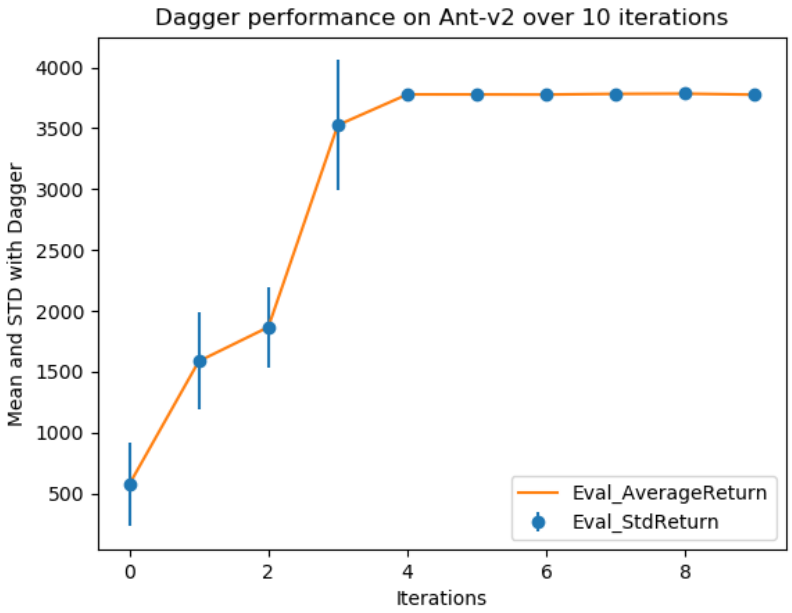

Figure 3: Dagger performance on Hopper-v2 over 10 iterations.