HW 1 Report

Tianzhe Chu ID: 3038670325

Q 1.2

Environment	Expert(Train)	BC(Eval)	Percent
Ant	4713.65±12.20	4765.25±119.90	101.09%
Walker2d	5566.85±9.24	43.02±85.44	0.72%
HalfCheetah	4205.78±83.04	4052.89±103.92	96.36%
Hopper	3772.67±1.95	885.88±10.22	23.48%

Above data are all under default condition with hyper paremeters as follows:

Parameter	Value
num_agent_train_steps_per_iter	1000
batch_size	100000
eval_batch_size	10000
train_batch_size	100

According to the data, the efficiency of Ant environment achieves 101.09% of the expert.

While the efficiency of Walker2d only achieves only 0.72%, which is lower than 30%.

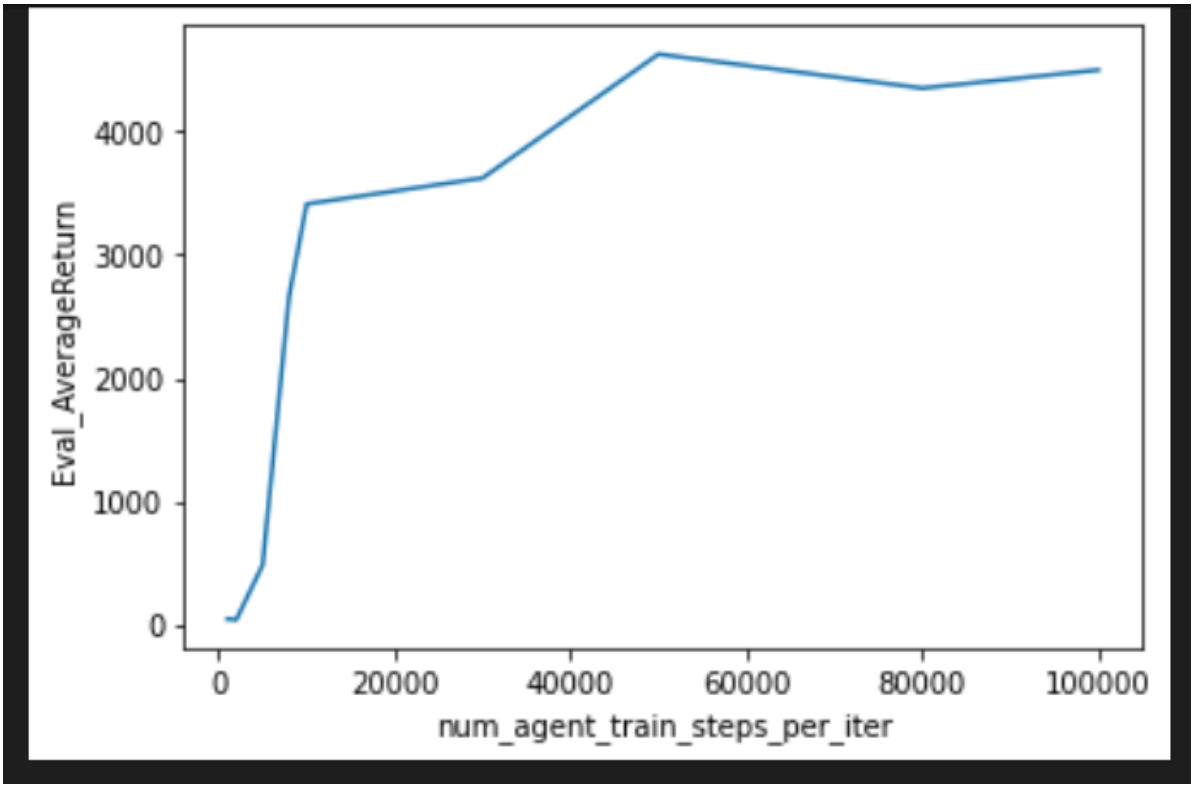
Q 1.3

In regard to Walker2d environment, I tested the efficiency by tuning the hyper parameter:

num_agent_train_steps_per_iter.

Value	BC(Eval)
1000	43.02±85.44
2000	36.18±81.06
5000	480.89±624.14
8000	2660.93±2043.44
10000	3412.61±2044.53
30000	3623.58±1314.26
50000	4629.73±1116.89

Value	BC(Eval)
80000	4353.81±1765.51
100000	4501.30±1133.83



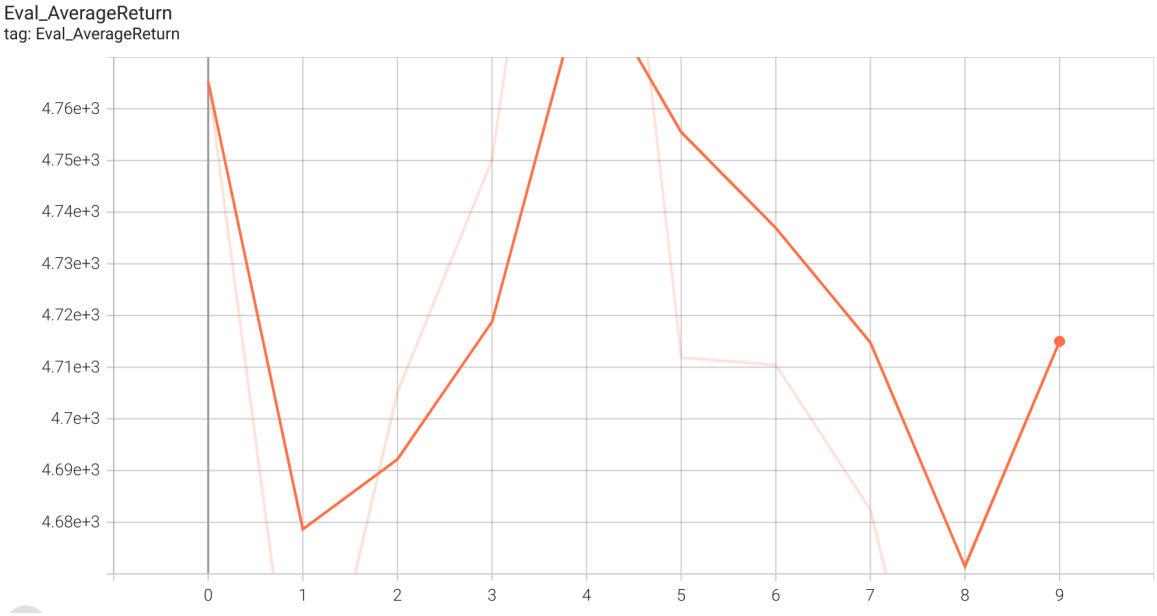
Reasons: The performance of Walker2d is not good when the num_agent_train_steps_per_iter is set 1000, due to lack of train steps.

Q 2.2

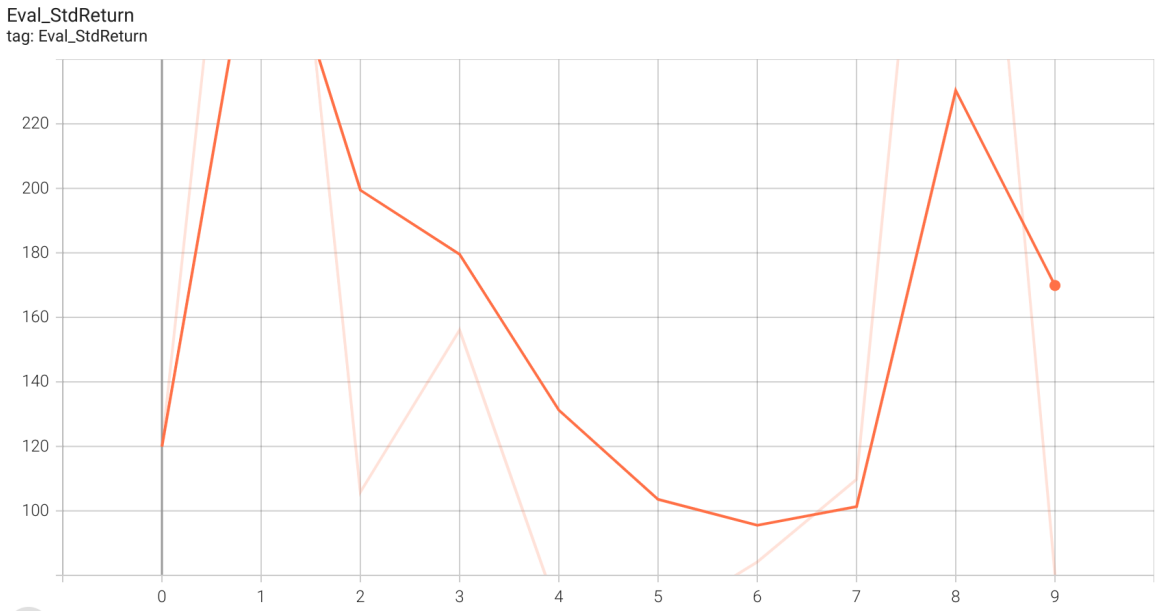
Hyper parameters are the same with Q 1.2.

Ant

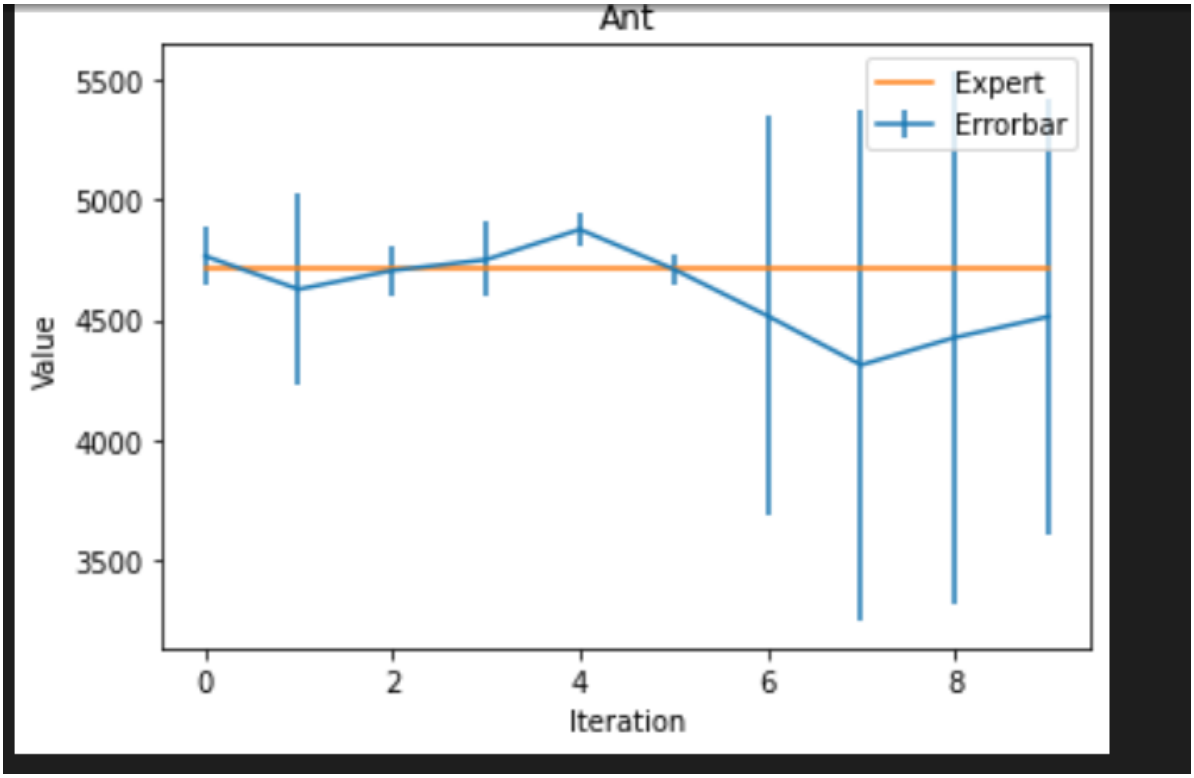
Average:



Std



Errorbar:

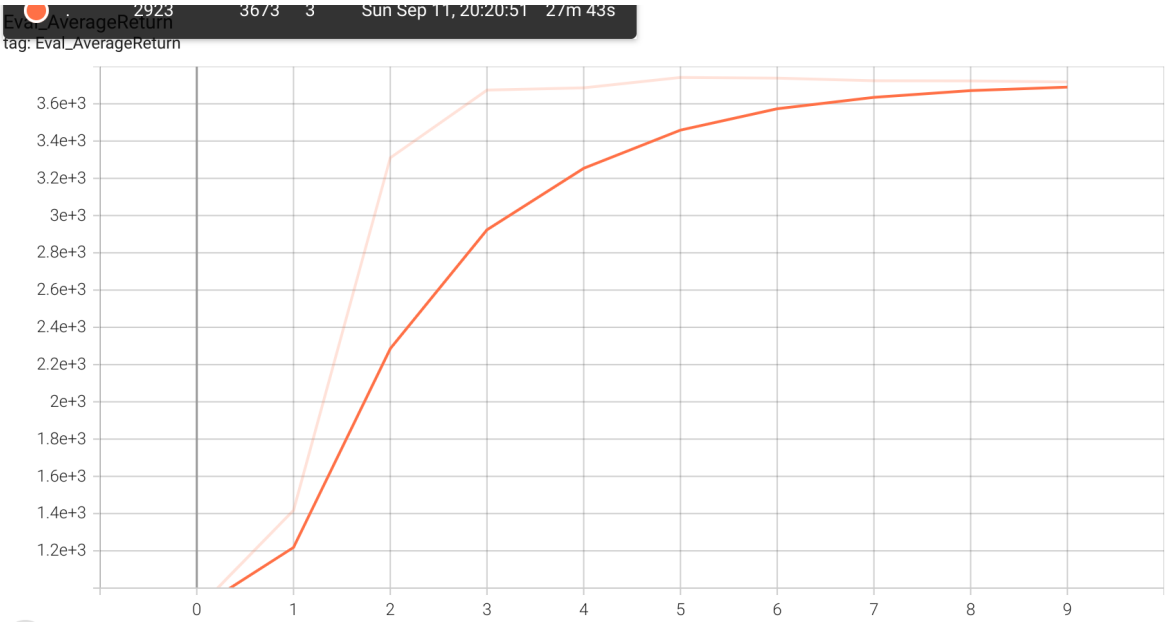


The first iteration(labeled 0) displays the performance of behavior cloning while the following iterations shows the performance of DAgger.

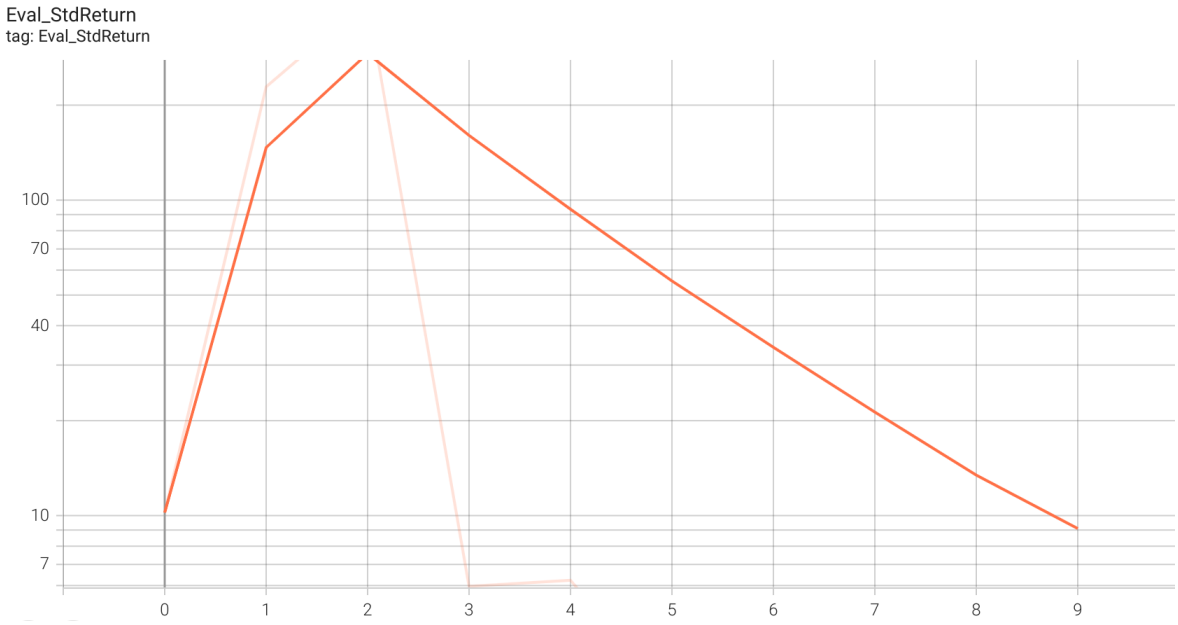
Since the original performance of behavior cloning is good, DAgger doesn't improve the performance a lot.

Hopper

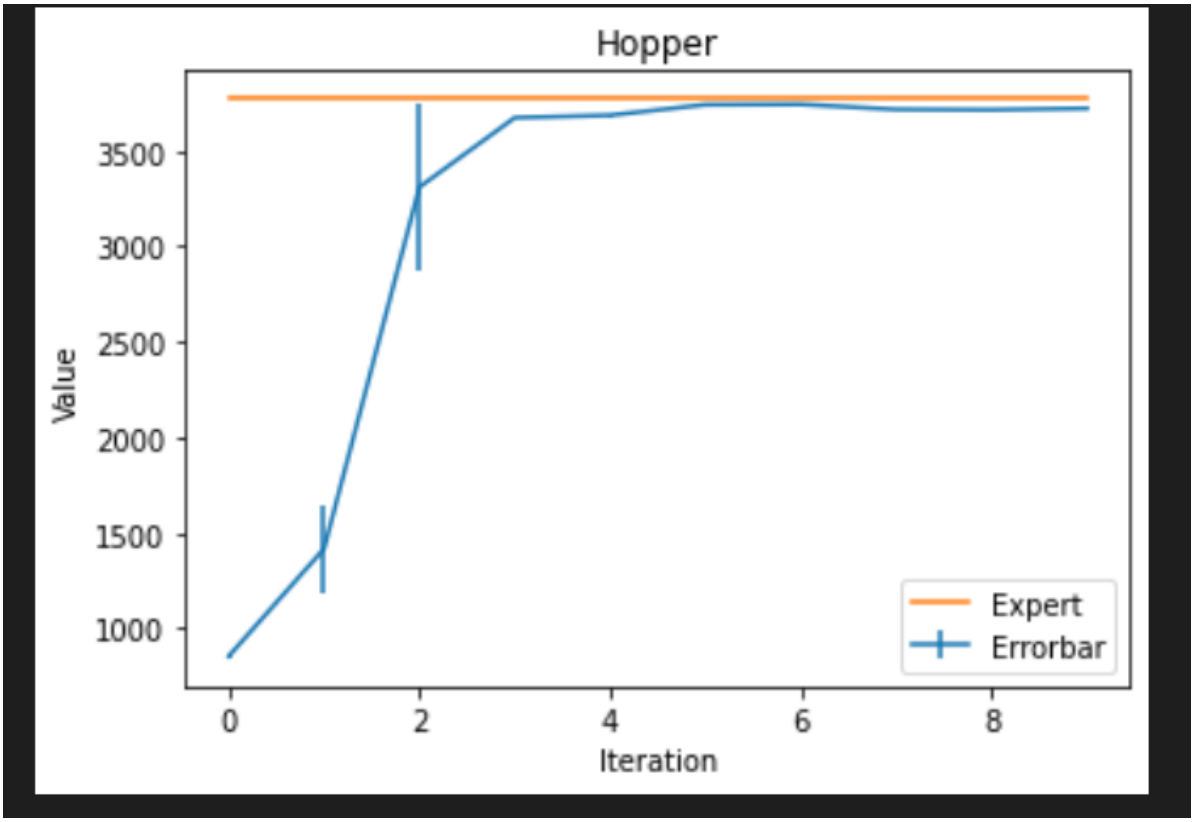
Average:



Std:



Errorbar:



The first iteration(labeled 0) displays the performance of behavior cloning while the following iterations shows that DAgger significantly increases the performance. Meanwhile, DAgger also helps to reduce std, which increases the stability of the algorithm.