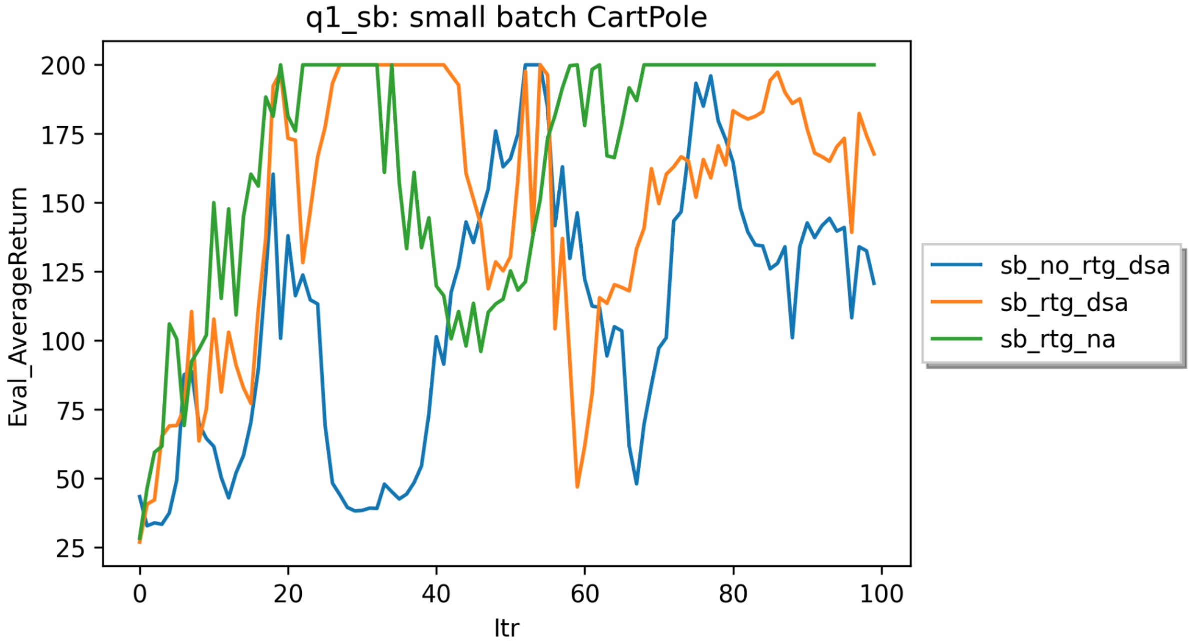
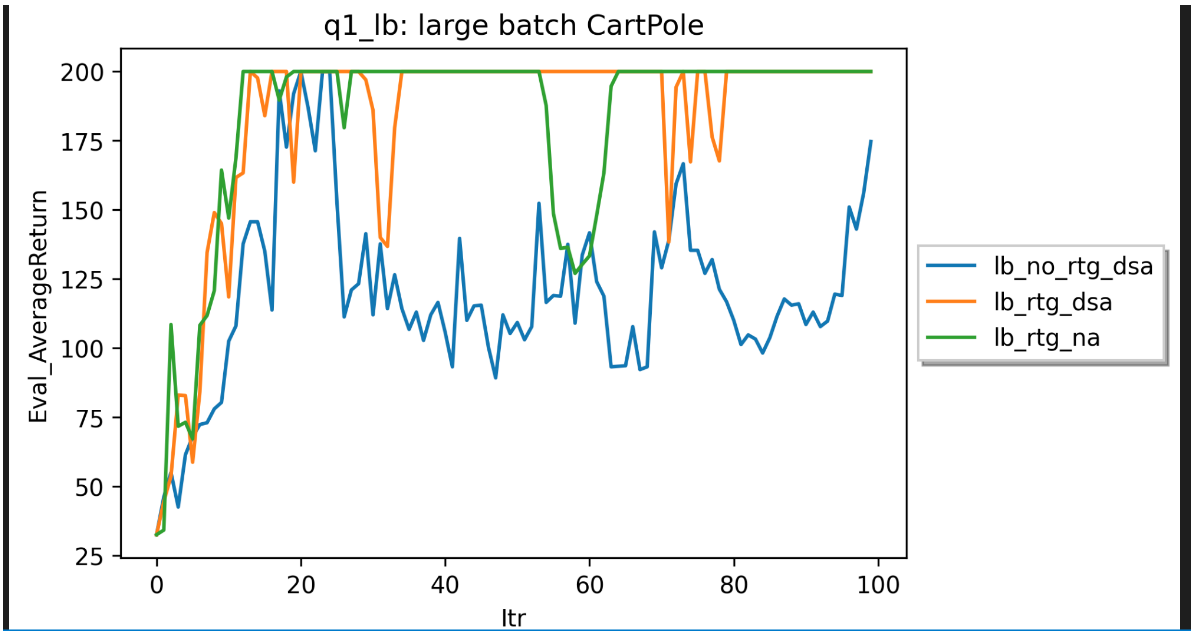
HW2 Policy Gradient

Experiment 1

Small batch



Large batch



-Which better? rtg or trajectory centric?

Reward to go.

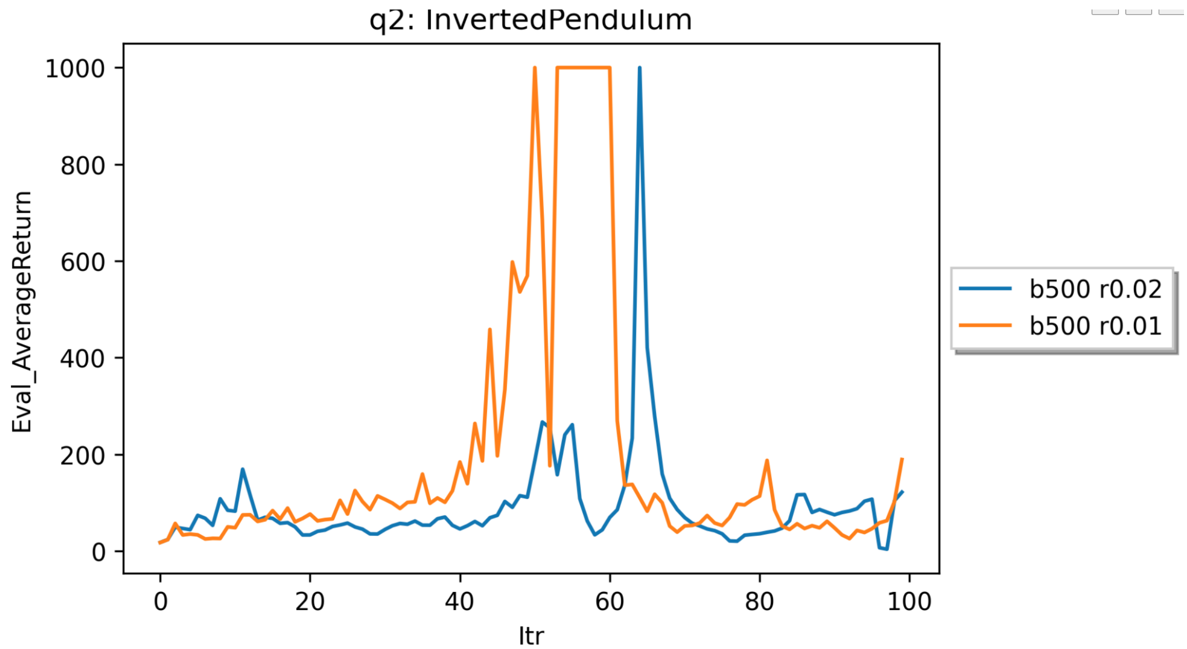
-Did advantage standardization help?

In small batch, it did increase the performance. In large batch, it didn't help a lot.

-Did batch size make an impact?

Yes. Large batch size increases the stability of the performance, and takes fewer iterations to reach 200.

Experiment 2

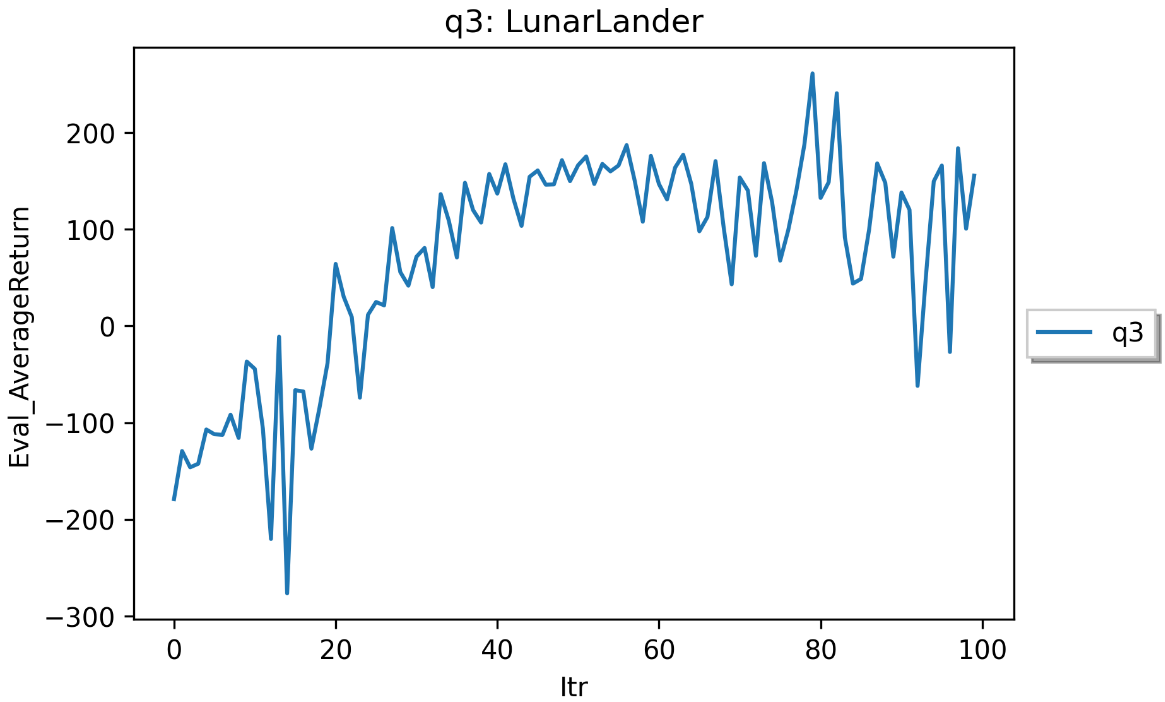


The smallest batch size for reaching 1000 is 500 with largest learning rate 0.02. The performance is not very stable.

Command:

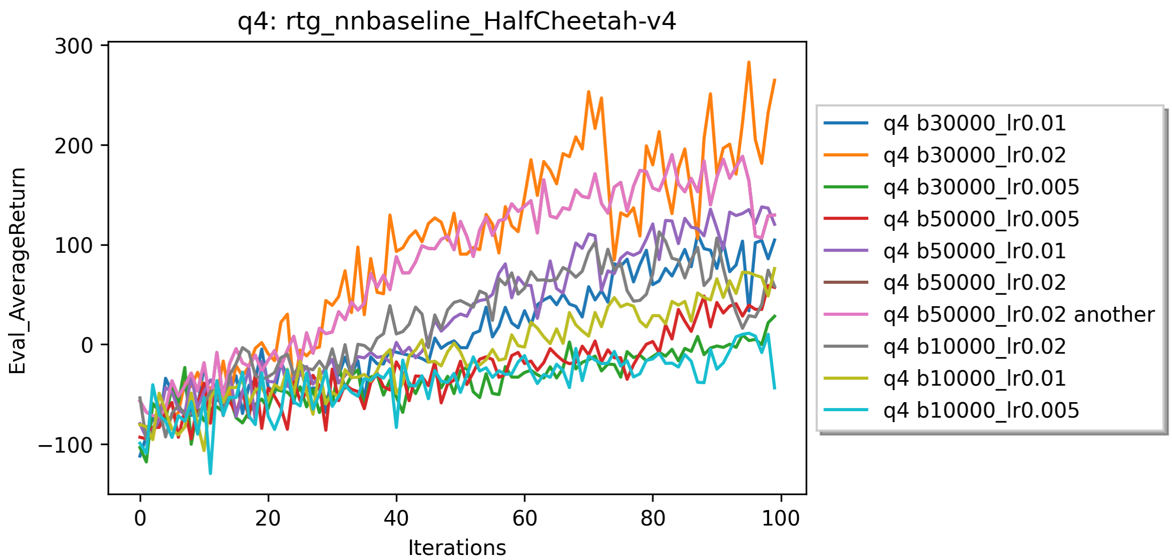
```
`python cs285/scripts/run_hw2.py --env_name InvertedPendulum-v4 \

--ep_len 1000 --discount 0.9 -n 100 -l 2 -s 64 -b 500 -lr 0.02 -rtg \

--exp_name q2_b500_r0.02`
```

Experiment 3



Experiment 4

(a)

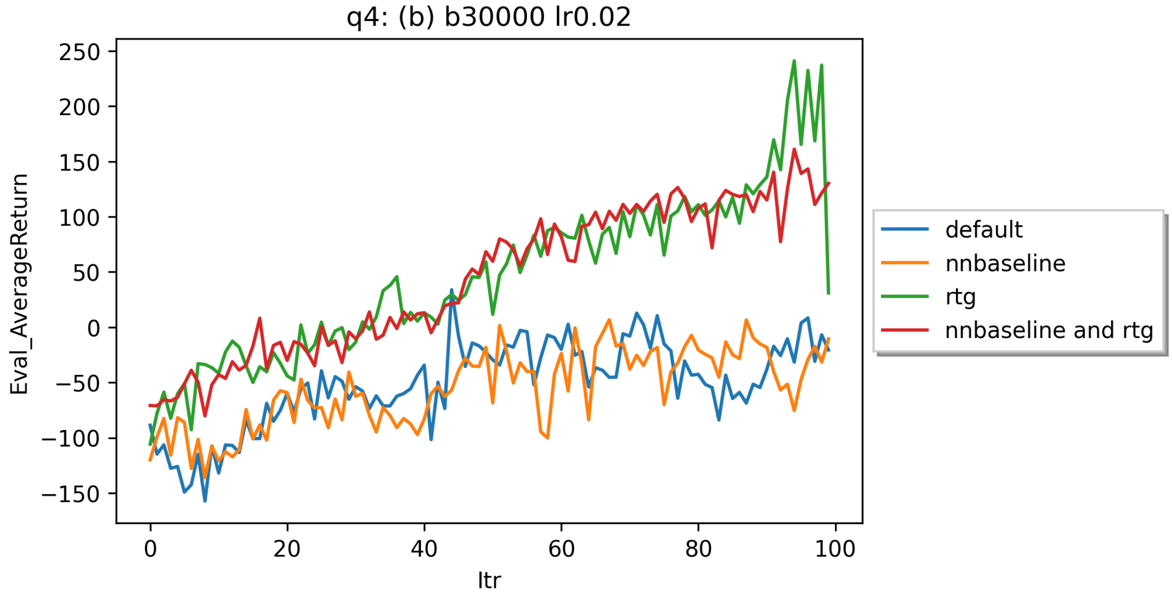


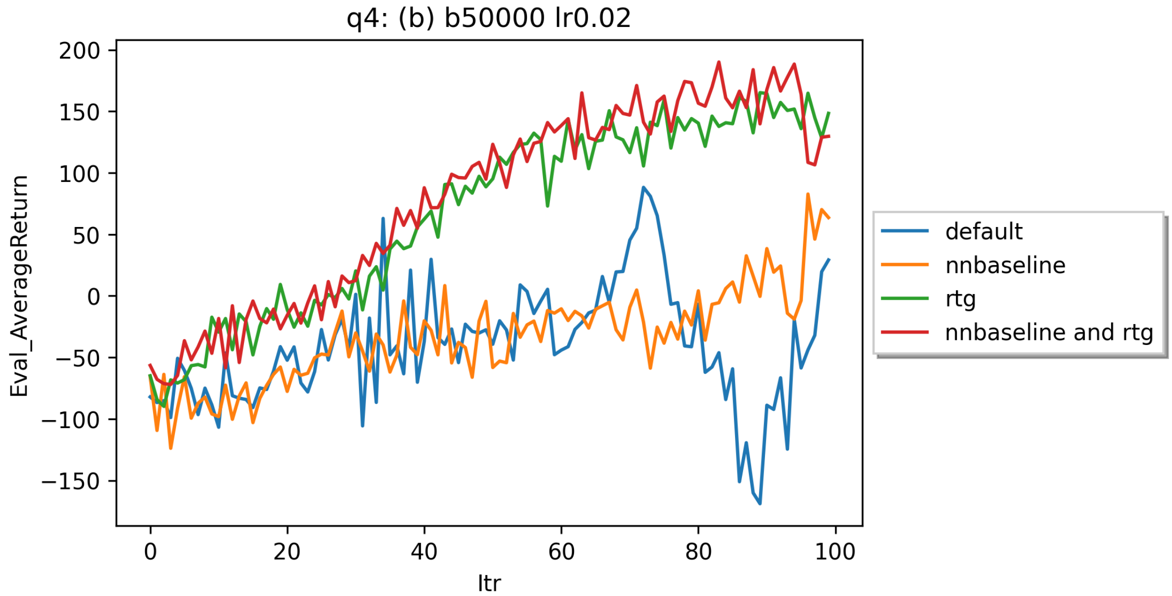
The one with batch_size = 30000 and learning_rate = 0.02 performances the best. Meanwhile, the one with batch_size = 50000 and learning_rate = 0.02 also behaves well.

Large learning rate increases the speed of convergence. Large batch size increases the stability of performance.

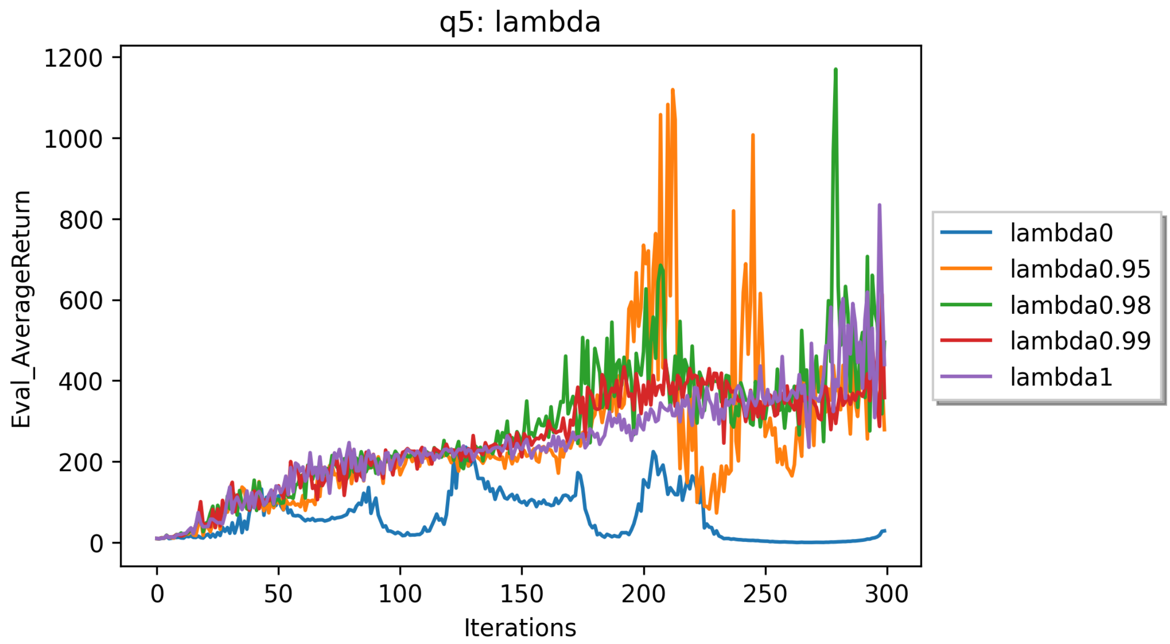
(b)

Since experiments with batch size of 30000 and 50000 both behave well, I applied both of them in this problem.





Experiment 5



$\lambda = 0.98$, the performance achieves its best.