Assignment 4: Model-Based RL and Exploration

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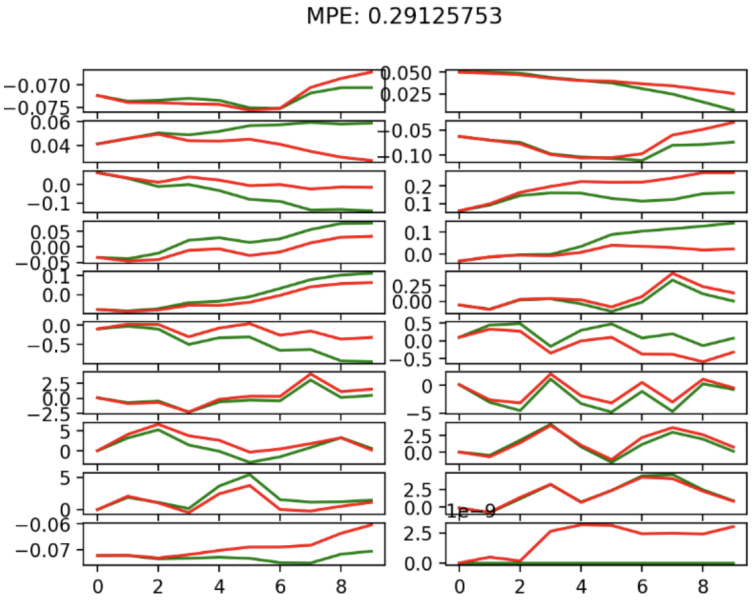
Collaborators:
NOTE: Please do **NOT** change the sizes of the answer blocks or plots.

1 Problem 1: Dynamics Model Training – [10 points total]

Theory questions

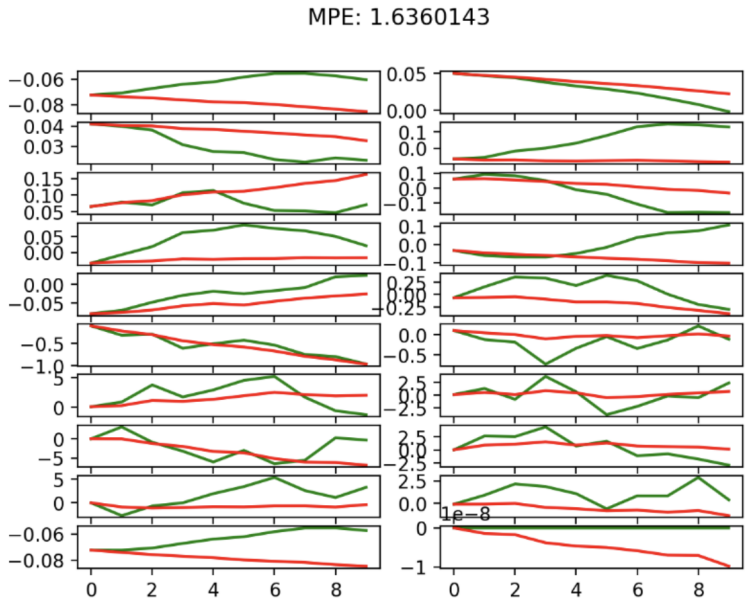
The third model: 500,2x250 performs the best. It combines the best properties of both the other models. It has a larger number of iterations and also has a large size of the hidden layer.

Plot



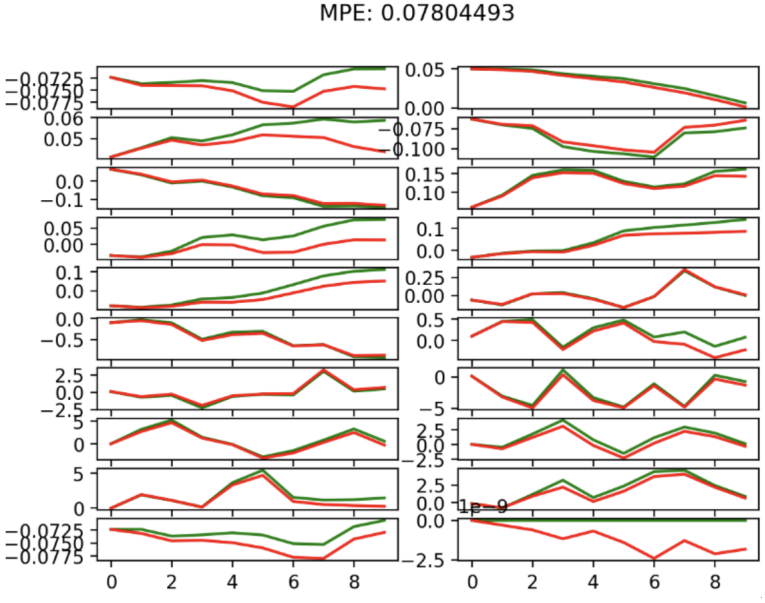
500,1x32

Plot



5,2x250

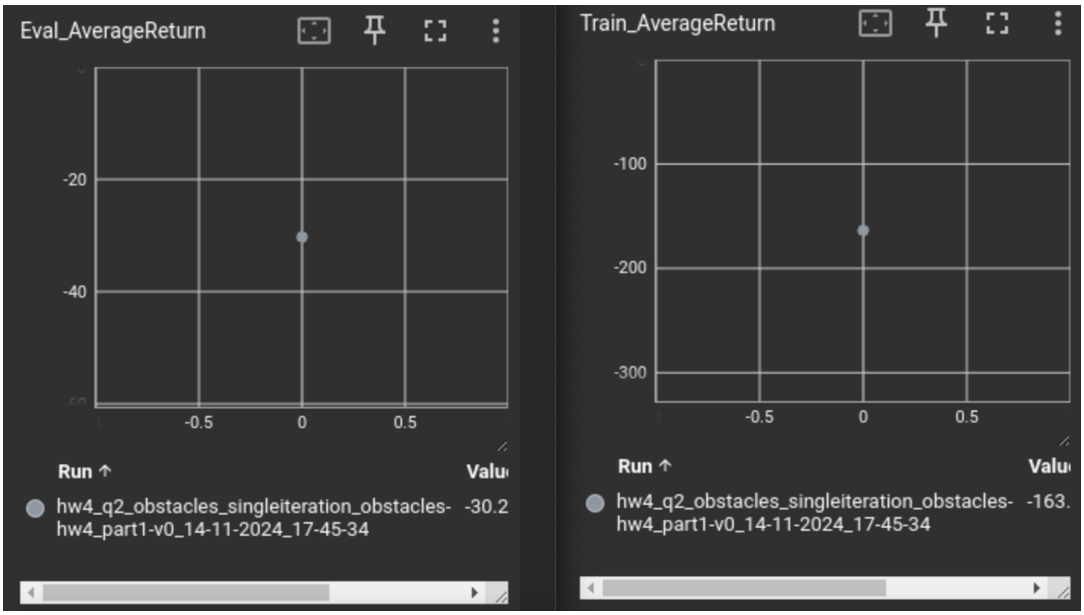
Plot



500,2x250

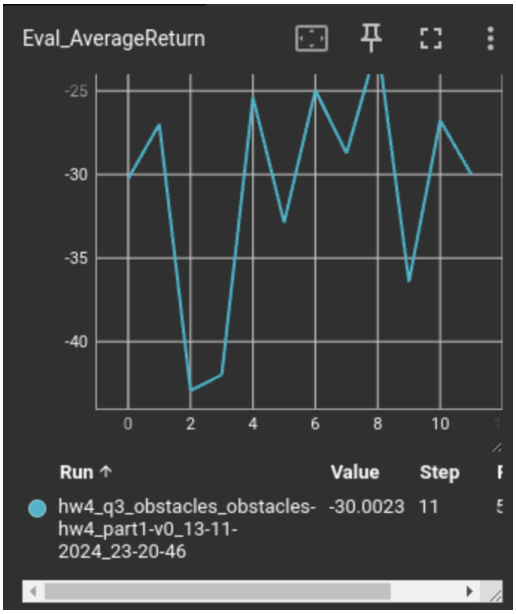
2 Problem 2: Action Selection

Plot



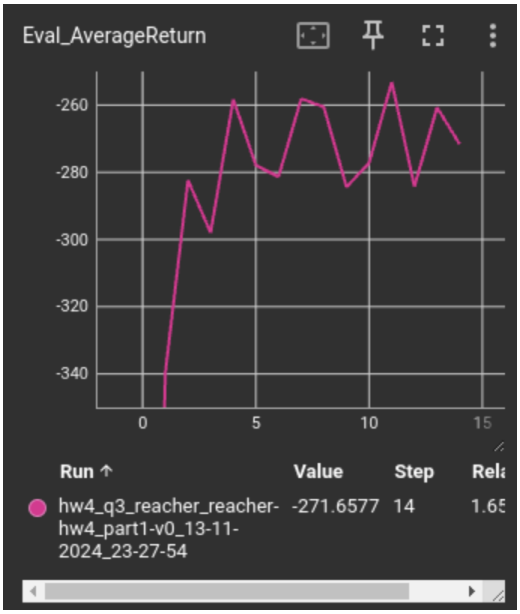
3 Problem 3: Iterative Model Training

Plot



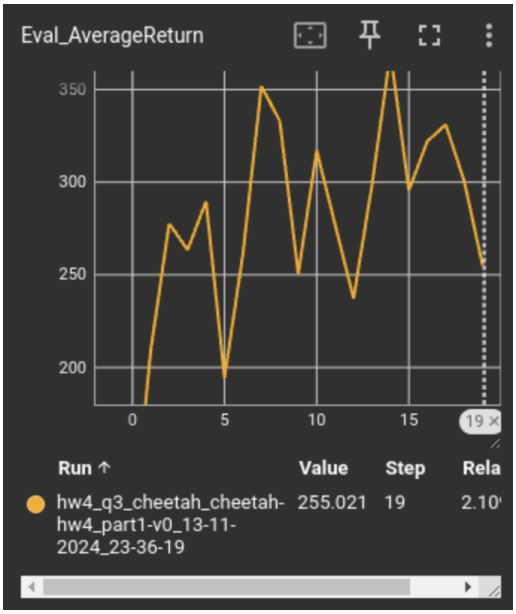
Obstacles environment

Plot



Reacher environment

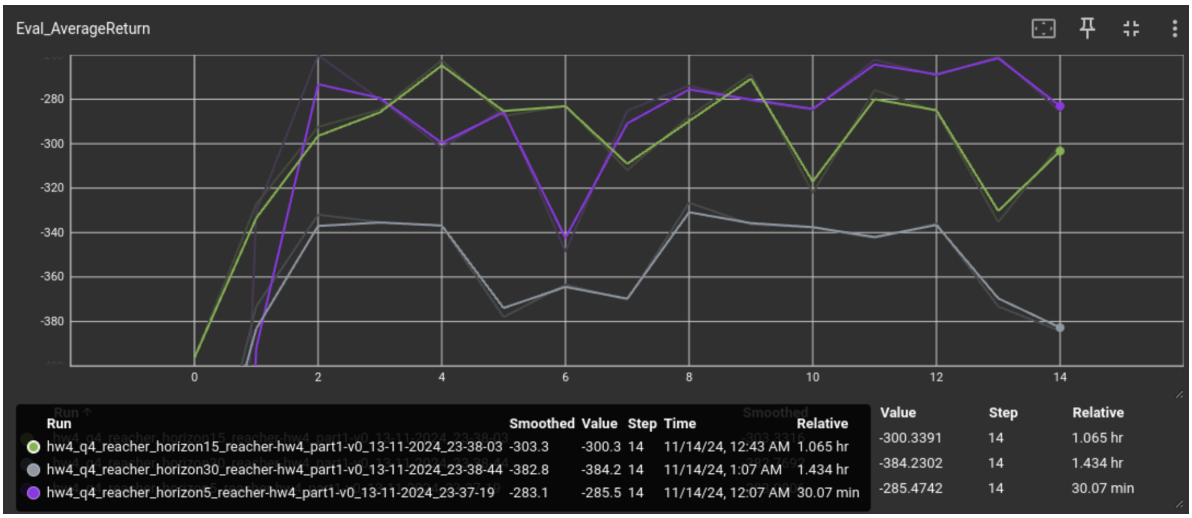
Plot



Cheetah environment

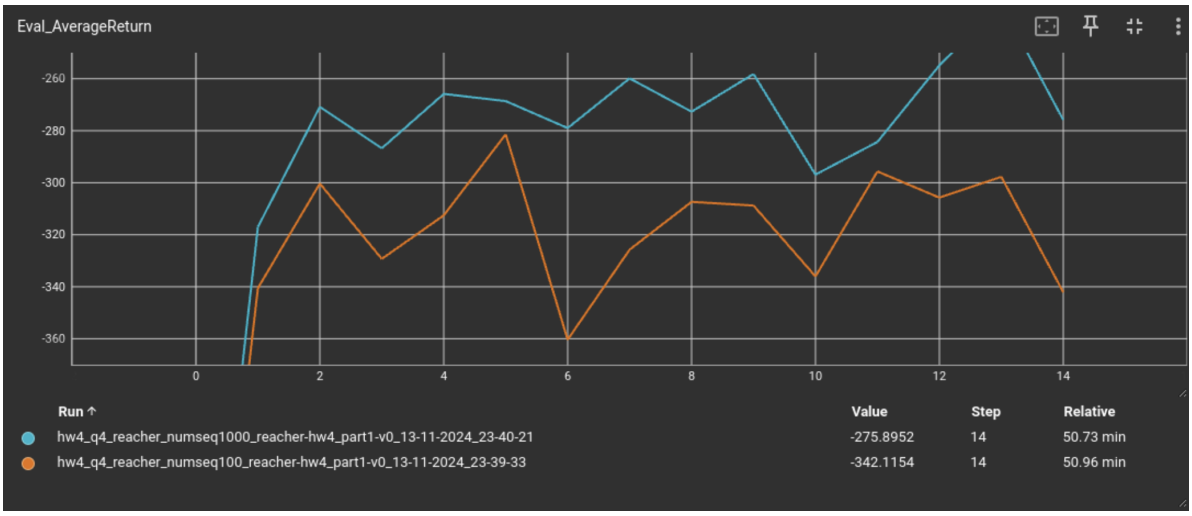
4 Problem 4: Hyper-parameter Comparison

Plot



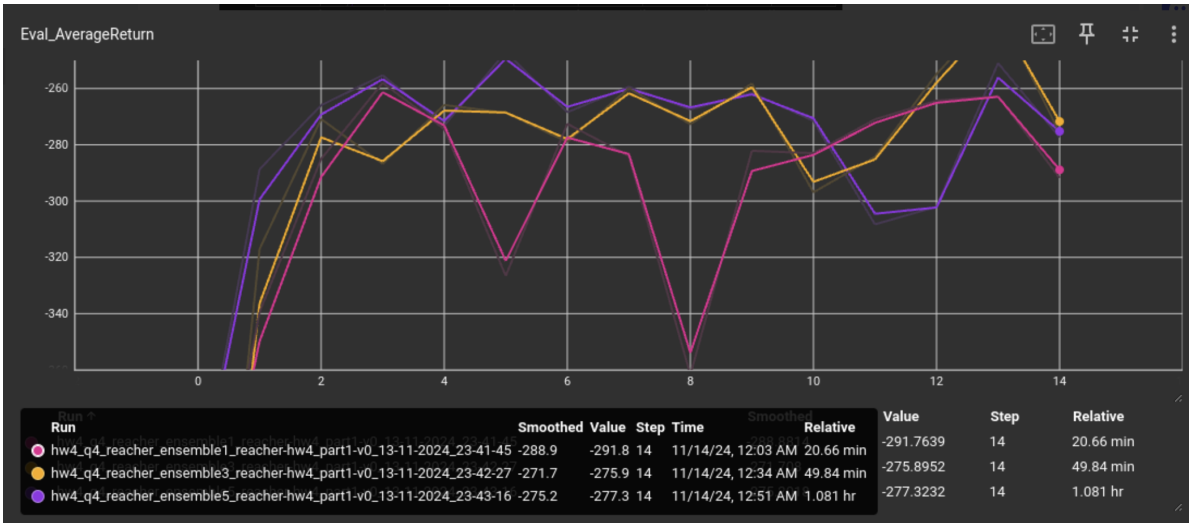
Increasing the horizon reduces the performance.

Plot



Larger number of sequences increases the performance.

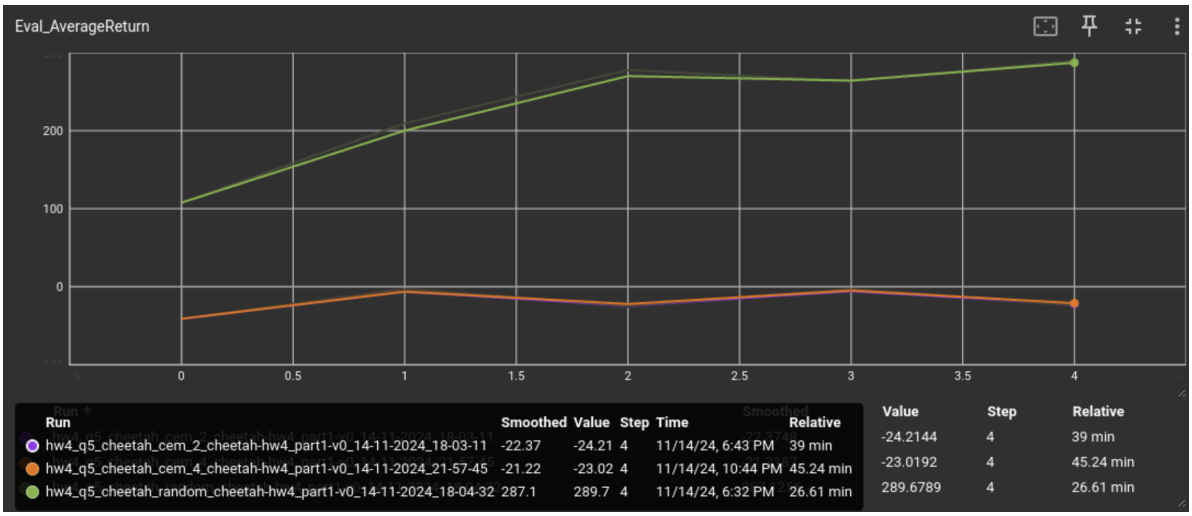
Plot



Considering more independently trained models increases performance.

5 Problem 5: Hyper-parameter Comparison (Bonus)

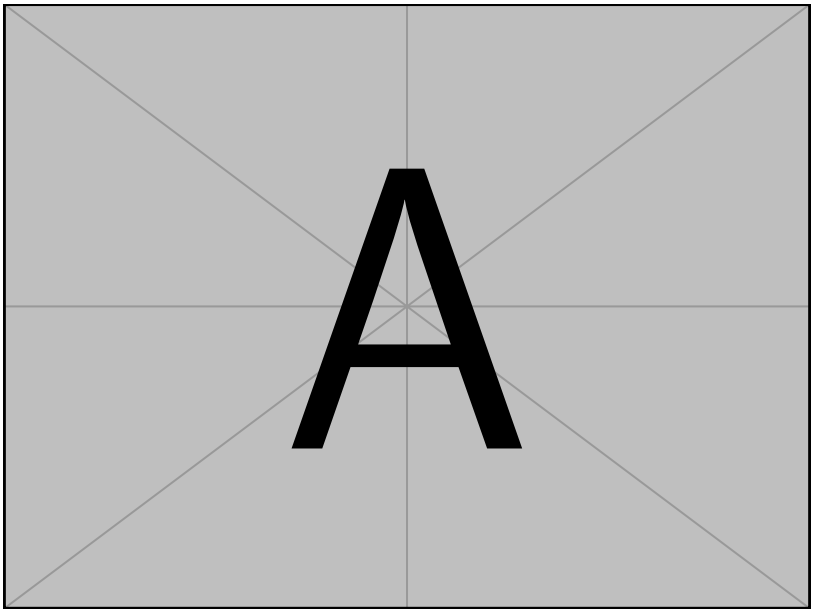
Plot



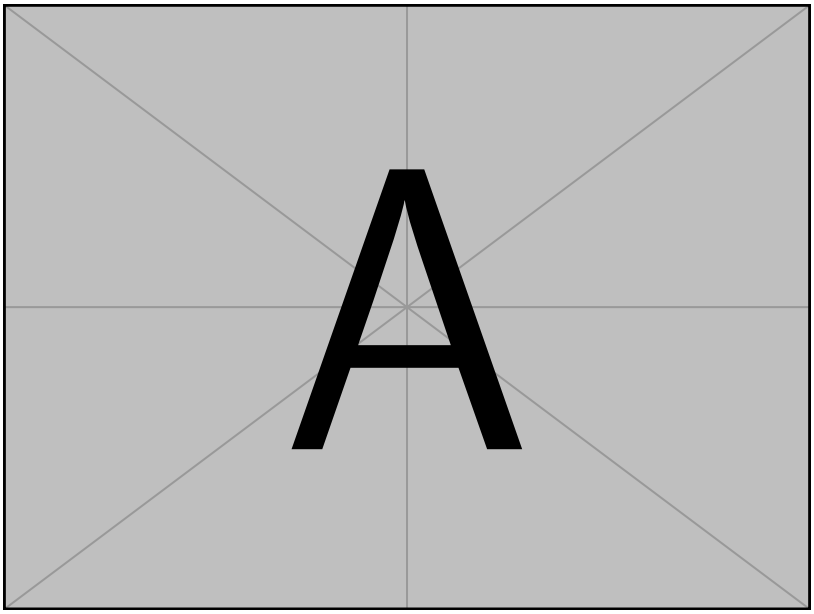
Random shooting performs significantly better than CEM, and also has a much lower training time. CEM with 4 sampling iterations performs ever so slightly better than with 2, but the model takes twice as long to train.

6 Problem 6: Exploration (Bonus)

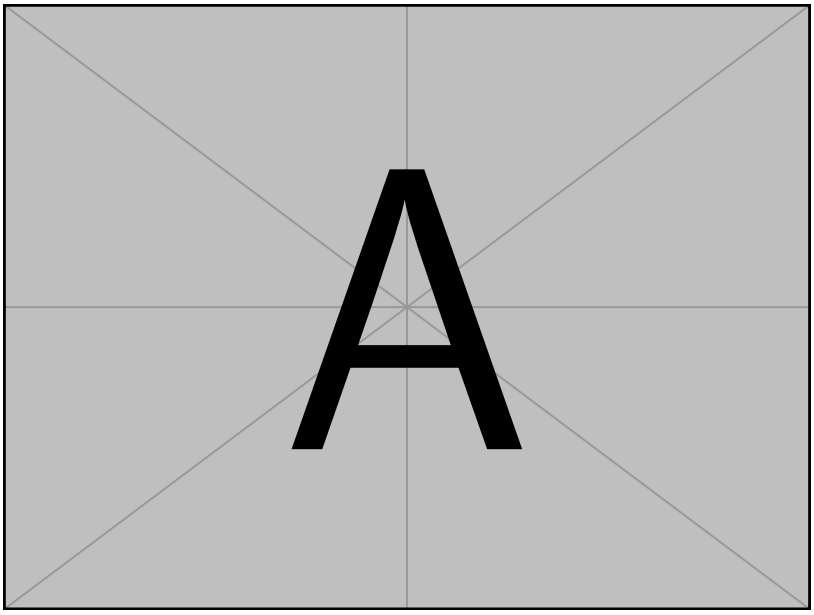
Plot



Plot



Plot



Plot