PSet 7 – CS 4649/7649

CS 4649/7649 Robot Intelligence: Planning

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# Prologue:

The starter code for this assignment in PSet7.zip implements REINFORCE with a few exceptions:

1. Lines are missing from forwardPass.py and backprop.py, so that we do not give away the answers to PSet6.py.
2. Reinfoce.py has two lines missing, Line 138 and Line 150.

# Problem 1:

We would like you to extend this starter code to implement as described in Lecture 12...

* CS 4649 -- Actor Critic, where you have two neural networks: a Q-function and a policy network.
  + Template code for AC.py
    - Please fill out the two lines in the update\_policy function
    - Please complete the update\_q function
* CS 7649 -- Advantage Function Actor Critic, where you have three neural networks: a Q-function, a value function, and a policy network.
  + Template code for A2C.py
    - Please fill out the two lines in the update\_policy function
    - Please complete the update\_q function
    - Please complete the update\_v function

You are more than welcome to collaborate, and, in fact, I encourage you to collaborate with your partners for the project! While each and every one of you must submit your own solutions, we will not penalize you if you and your partners submit the same solutions! I am doing this to try to encourage you all to work together as a team as much as possible.

To receive full credit for PSet7, you must submit your code (implemented correctly and running), all other files in the template code directory, and png files of the plots generated by plotDiagnostics(), and that's it! Please submit all required files and the plots to Gradescope under Pset7.

We have test setup on Gradescope to test your implementations of the policy update, q update, and v\_update (for 7649). These are to help you iterate and debug quickly. **Please start this assignment early! Generating the full plots can take about an hour of runtime, so last minute debugging will be difficult.**

Rubric:

CS4649:

* Reinforce (20 pts)
* Reinforce plot (20 pts)
* AC update\_policy (20 pts)
* AC update\_q (20 pts)
* AC plot (20 pts)

CS7649:

* Reinforce (15 pts)
* Reinforce plot (20 pts)
* A2C update\_policy (15 pts)
* A2C update\_q (15 pts)
* A2C update\_v (15 pts)
* A2C plot (20 pts)