CMPSCI 687: Homework 7
Fall 2020

Philip S. Thomas
University of Massachusetts
pthomas@cs.umass.edu

For this assignment, you will implement REINFORCE, dropping the extra γ^t term that is normally dropped. A C++ framework to use, which is based on the one from HW2, is provided here. Your job is to fill in the missing lines in the function `REINFORCE::episodicUpdate` within REINFORCE.cpp so that it implements Algorithm 15 from the course notes.

When run, the program creates out.csv. Copying the contents of out.csv to LearningCurve.xlsx will provide a learning curve, as in HW2. Your job is to correctly implement Algorithm 15 (REINFORCE) from the course notes, which should produce the out.csv file included in the C++ framework provided. There may be minor differences in performance due to compilers. You must also change the step size to *increase* the area under the learning curve for REINFORCE relative to the performance of REINFORCE within the provided out.csv file. The step size is set within the constructor with the line that initially reads: `alpha = 0.01;`.

You should submit your updated REINFORCE.cpp file only, and should ensure that your code compiles and runs without modification to any other files.

1 Due Date

The assignment is officially assigned on November 18, and due on December 2. All students may have an extension until December 7, without penalty, as described for HW1 via email.

2 Eigen

The provided code relies on the Eigen library, which is included in the code provided.

3 Compilers

Your code must compile with either gcc (any recent version) or the compiler included with Microsoft Visual Studio. Note that Macs often pretend to be using gcc when they are really using CLang (which we will *not* be using in our grading pipeline).

4 Cheating

For this assignment, all code that you submit must either be code that you wrote, or code that you were provided with the assignment. Although you can discuss high-level topics, all coding must be done individually. You may not use any additional libraries (other than C++ standard libraries and Eigen).

5 Hacking

This is not a security course. If the code that you submit attempts to compromise the machine it is running on (e.g., deleting or reading files outside of the project directory, downloading viruses or back-doors, etc.) it will be reported to the police (and depending on whether the machine was ever used for our DARPA or Army research, the FBI), and will result in your failing the course (via the "inappropriate behavior" clause in the syllabus).

6 Extra Credit

If there are any bugs in the assignment, the first person to point the bug out to me via email (pthomas@cs.umass.edu) will receive 5% extra credit on this assignment. Typos and inconsequential bugs will not receive extra credit.

7 Assignment Changes

If any changes are made to the assignment after it is posted, this document will be updated and a description of changes included below.