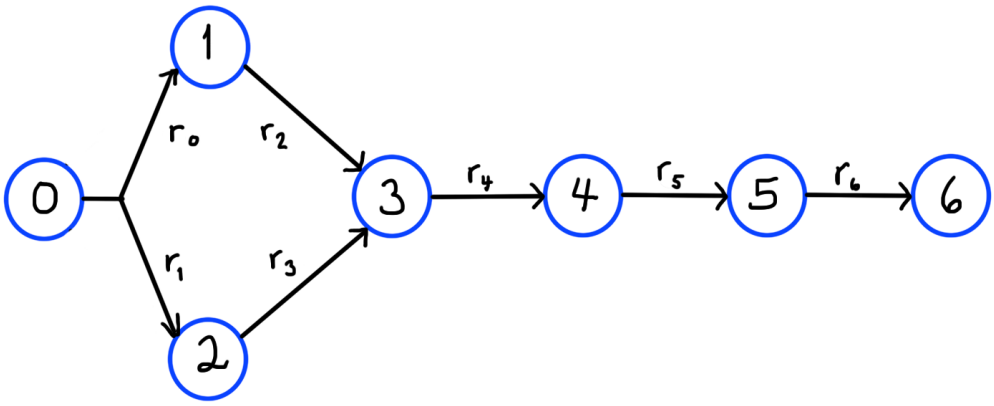
Assignment

Title	Homework # 2
Due	Jun 5, 2017 9:00 am
Grade Scale	Points (max 100.0)
Modified by instructor	May 18, 2017 8:20 pm

Instructions

Homework 2: TD Lambda

Recall that the \(TD(\lambda) \) estimator for an MDP can be thought of as a weighted combination of the k-step estimators \(E_k \) for k ≥ 1. Consider the MDP described by the following state diagram. (Assume the discount factor is \(\gamma = 1 \).)



Find a value of \(\lambda \), strictly less than 1, such that the TD estimate for \(\lambda \) equals that of the \(TD(1) \) estimate. Round your answer for \(\lambda \) to three decimal places.

This HW is designed to help solidify your understanding the T emporal Difference algorithms and k-step estimators. Y ou will be given the probability to state 1 and a vector of rewards(\({r0, r1, r2, r3, r4, r5, r6}) \)

You will be given 8 test cases for which you w ill return the best lambda value for each. Y our answer will be graded to 0.001 precision. You may use any programming lan guage and libraries you wish.

Sample Tests Cases

- **Input:** probToState=0.81, valueEstimates={0.0,4.0,2 5.7,0.0,20.1,12.2,0.0}, rewards={7.9,-5.1,2.5,-7.2,9.0,0.0,1.6}
  Output: 0.6226326309908364
- **Input:** probToState=0.22, valueEstimates={0.0,-5.2, 0.0,25.4,10.6,9.2,12.3}, rewards={-2.4,0.8,4.0,2.5,8.6,-6.4,6.1}
  Output: 0.49567093118984556
- **Input:** probToState=0.64, valueEstimates={0.0,4.9,7 .8,-2.3,25.5,-10.2,-6.5}, rewards={-2.4,9.6,-7.8,0.1,3.4,-2.1,7.9}
  Output: 0.20550275877409016