PSG College of Technology

Department of Applied Mathematics and Computational Sciences

Reinforcement Learning Lab 2023-‘24

VIII Semester M.Sc. DS/TCS

Lab Assignment 3

**Intelligent Tutoring System** is a recommendation system. One of the most important task of an ITS is to recommend new learning objects (materials) to learners in e-learning systems. Assuming that the task is to recommend courses to learners with the purpose of giving the learners courses with highest rate of finishing.

There are N courses that the ITS can recommend to learner. Each course has an unknown rate of success pi. ai and bi is the historical number of success (number of learners that finished the course) and failure (number of learners that dropped the course). Model it as MAB and define the regret of a strategy after T plays as

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with µi is the mean success of the arm, ni is the number of times that arm *i* is played, T is the total number of plays and N is the total number of arms.

Compare the regret of the following algorithms (graphs for simulated results)

* Decaying ε-greedy algorithm
* Apply greedy and UCB1
* Let the number of courses be 100 and find out the minimum number of iterations after which UCB1 strategy even performs worse than greedy