PSG College of Technology

Department of Applied Mathematics and Computational Sciences

Reinforcement Learning Lab 2023-‘24

VIII Semester M.Sc. Data Science/MSc TCS

Lab Assignment 4

Viral marketing aims to leverage a social network to spread awareness about a specific product in the market through information propagation via word-of-mouth. Specifically, the marketer aims to select a fixed number of ‘influential’ users (called seeds) who will influence other users in the social network. This will result in information propagating through the network as an increasing number of users adopt or become aware of the product. The goal is to maximize the spread of this influence, and this problem is referred to as **influence maximization (IM)**

1. Model it as MAB.

* In each of the T rounds, a superarm A (a set of seeds with cardinality k) is played, which triggers arms in A and also other arms. Let piJ denote the triggering probability of arm i if arm j is played.
* In each trial an influence budget, b, [0 1] is generated. An arm ‘i’ is considered ‘influenced by superarm A’, if piA >b [triggering probability of superarm A >b].
* The total number of users influenced is taken as the reward of the arm (seed).

1. Identify optimal seeds according to the following algorithms

* Greedy algorithm
* UCB1