BITS F444/CS F407 – Artificial Intelligence
I Semester 2020-2021
Assignment on Q-Learning
Weightage: 20%
Due Data: 25th Nov. 2020

Implement a Q-learning based solution for any 2 player game of your choice. You are required to do the following:

1. Take inputs about the size of the game (for example – number of dots in the dots & boxes game or no. of cells in mine sweeper game)
2. Should be able to analyze performance by varying the following parameters:
    a. Learning Rate, α
    b. Discount Factor, γ
    c. Exploration Quotient, ε
3. Train the Q-learning algorithm in the following scenarios:

First player	Second player	Name of agent produced
Q-learning agent Random	Agent	Q1
Q-learning agent	Q-learning agent	Q2
Q-learning agent	Simple Agent	Q3
Q1	Q-learning agent	Q4
Q2	Random agent	Q5
Q4	Q5	Q6
Q3	Q1	Q7
Q1	Q2	Q8

4. Draw your conclusions about Q-Learning from the experiments carried out in 2 & 3. Please note that you may have to play hundreds of thousands of games to reach a particular level of competence in the chosen game.

No more than 2 students can be part of a team. Differential marks will be given to team members.

Due date for submission of assignment is 25th Nov.

You need to submit a word doc. which should describe Q-Learning in your own way (do not copy and paste from any source). Your report should also include all the results and analysis and conclusions. Please note that a good original report will get a good reward. You also need to give a demo at the time of viva/presentation.