

# CS5542 Big Data Apps and Analytics

In Class Programming –10

29<sup>th</sup> October 2020

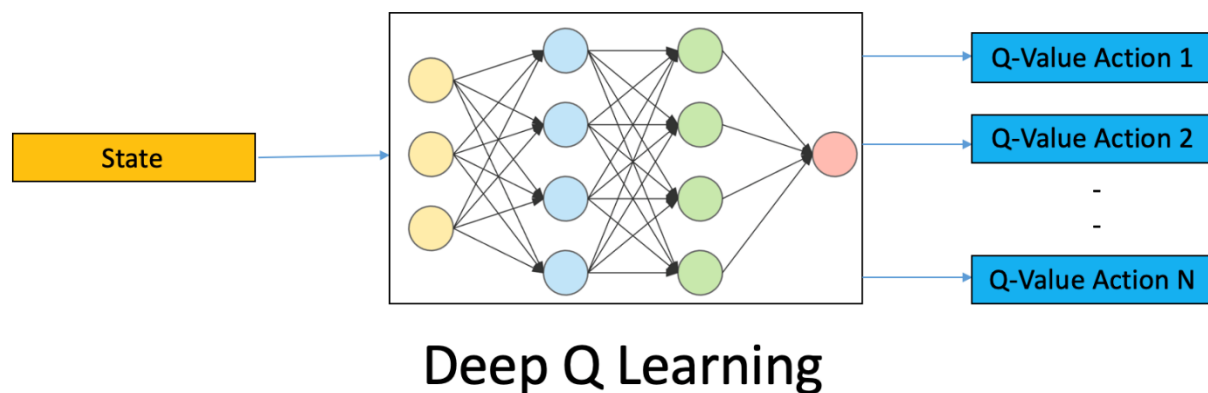
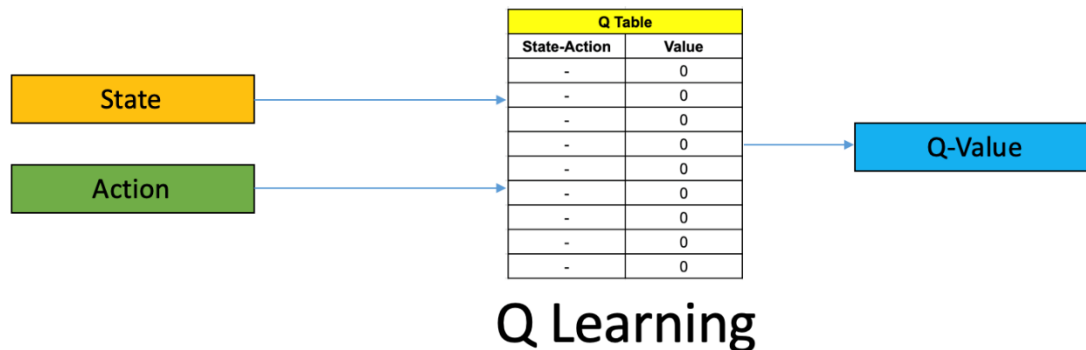
Due Date: 11/3/2020 (Tuesday by 11:59pm)

Submit ICP Feedback in Class. : [Lnk to Feed back Form](#)

## Deep Q-Learning:

### Implementing Deep Q-Learning in Python using Keras & OpenAI Gym:

In deep Q-learning, we use a neural network to approximate the Q-value function. The state is given as the input and the Q-value of all possible actions is generated as the output. The comparison between Q-learning & deep Q-learning is illustrated below:



CartPole is one of the simplest environments in the OpenAI gym (a game simulator). The idea of CartPole is that there is a pole standing up on top of a cart. The goal is to balance this pole by moving the cart from side to side to keep the pole balanced upright.

Design a Deep Q learning Network (DQN), using Keras & OpenAI Gym , for cartpole game and visualize your results.

ICP Requirements:

- 1) Designing a DQN for cartpole game in python using Keras & OpenAI Gym (70 points)
- 2) Visualization of DQN cartpole game (10 points)
- 3) overall code quality (10 points)
- 4) Pdf Report quality, video explanation (10 points)

Submission Guidelines:

Same as previous ICPs.