**CSE510 - Final Project Proposal**

**Members: Sandesh Kumar Srivastava(sandeshk)**

**Venkata Narayana Rohit Kintali(vkintali)**

**Topic**: Exploring deep RL Algorithms on Atari Open AI

**Objective**:

* We plan to use DQN and DDQN algorithms to solve more complex environments like Atari Breakout for the final project.
* In addition to solving the environment, we will also study the effect of different hyperparameters on the performance of the agent and improvise the existing model built.
* We will demonstrate the improvement in performance by showing the agent behaviour in the beginning and after training is done.

**Technical Outline**:

* We are going to extend the DQN and DDQN algorithm implemented for Assignment 2 to solve Atari Breakout.
* Instead of fixed vector states, we are going to use image frames as states of environment.
* We will do some preprocessing of image frames using Convolution Layer 2D,Max Pooling Layer 2D and Dense Layer with different activation functional units on the layers like ‘RELU’,’SOFTMAX’ and ‘LINEAR’.
* The output would be Q(s,a) given state s and action a for 18 joystick/button positions.
* The reward would be the change in score for each step performed.It would have a large action space involving selection and control of hidden layer units.

**Environment & Algorithm**:

* We are going to use the Breakout -v0 environment and implement DQN & DDQN algorithms to solve it.
* We plan to show the comparison of our algorithm with some basic algorithms like Q-learning etc. if feasible in the time frame.