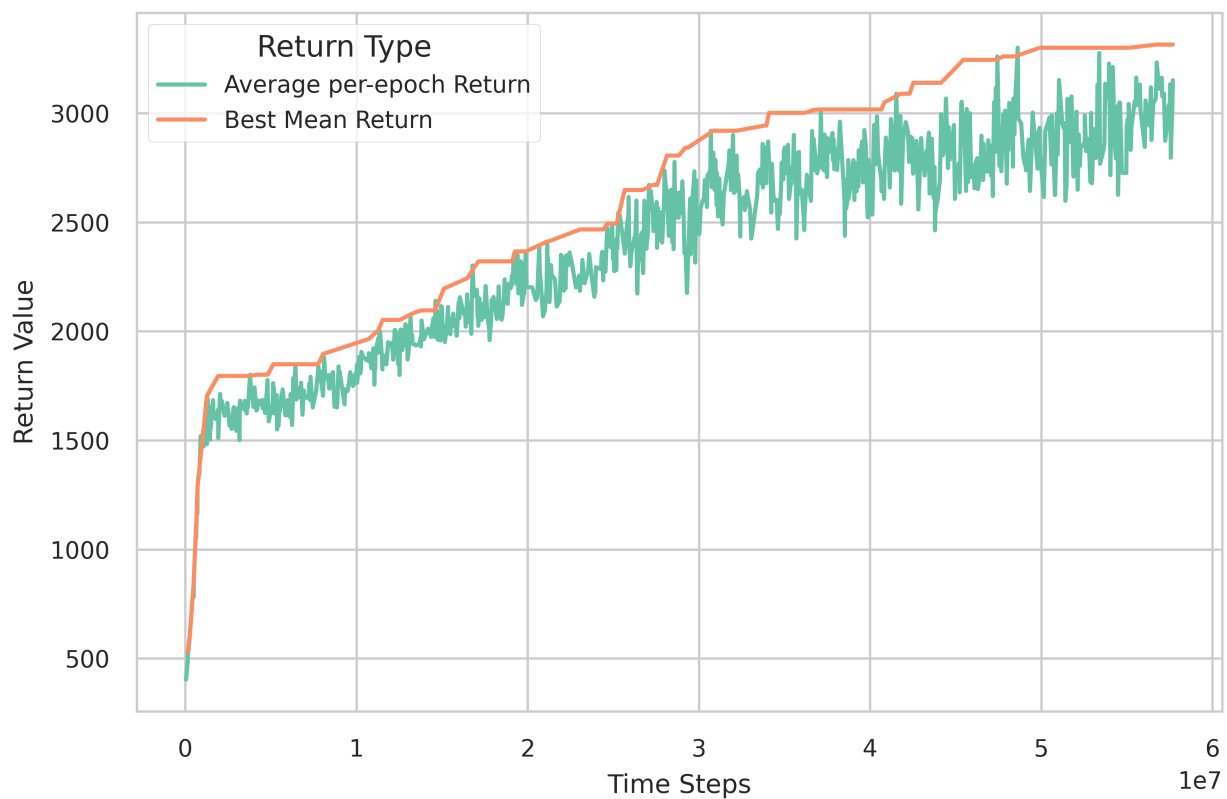


## Homework 3

Juanwu Lu (3037432593)  
(M.Sc. Civil Engineering, UC Berkeley)

### 1 Part 1: Q-Learning

#### Question 1: basic Q-learning performance (DQN)



**Figure 1.** DQN performance on Ms. Pac-Man in average per-epoch return (cyan curve) and best mean return (red curve) versus number of time steps. Performance of the algorithm shows a step increasing trend. However, the average per-epoch return variances are also increasing.

## Question 2: double Q-learning (DDQN)

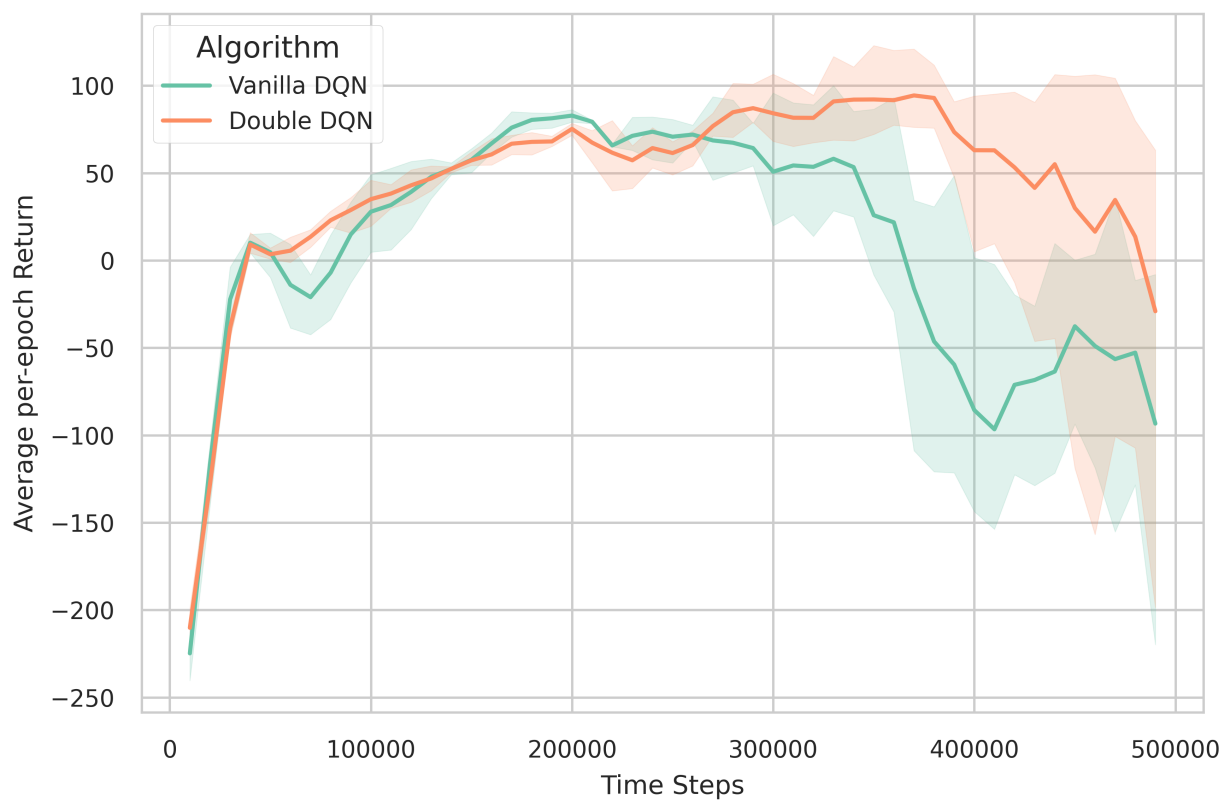


Figure 2

## Question 3: experimenting with hyperparameters

## 2 Part 2: Actor-Critic

### 3 Part 3: Soft Actor-Critic