Reinforcement Learning Assignment 3

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2019-4-19

1   Introduction

The goal of this assignment is to do experiment with model-free control, including on-policy learning (Sarsa) and off-policy learning (Q-learning). For deep understanding of the principles of these two iterative approaches and the differences between them, you will implement *Sarsa* and *Q-learning* at the application of the Cliff Walking Example, respectively.
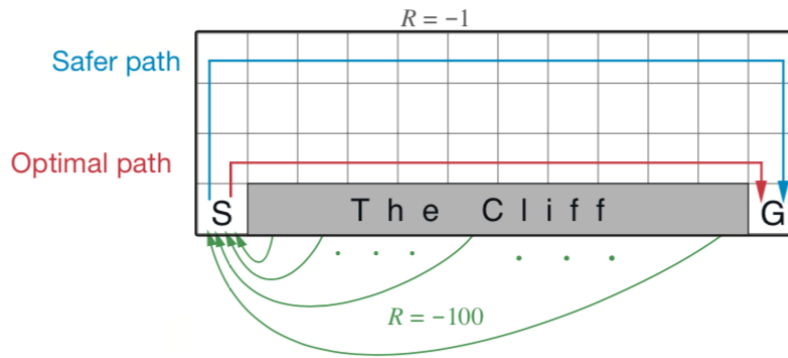
2   Cliff Walking

Figure 1: Cliff Walking

Consider the gridworld shown in the Figure 1. This is a standard undiscounted, episodic task, with start state (S), goal state (G), and the usual actions causing movement up, down, right, and left. Reward is -1 on all transitions except those into the region marked "The Cliff". Stepping into this region incurs a reward of -100 and sends the agent instantly back to the start.

3   Experiment Requirments

- Programming language: python3

- You should build the Cliff Walking environment and search the optimal travel path by Sara and Q-learning, respectively.

- Different settings for ϵ can bring different exploration on policy update. Try several ϵ (e.g. $\epsilon = 0.1$ and $\epsilon = 0$) to investigate their impacts on performances.

4   Report and Submission

- Your reports and source code should be compressed and named after "studentID+name".

- The files should be emailed to TA (yuankunjiang@126.com) before April 25, 2019, 23:59 (UTC+08:00).