Project Description

We aim to solve the “cliff walking” problem using the search methods introduced in Lecture 4,
including depth first search (DFS), breadth first search (BFS), uniform cost search (UCS), greedy search, and A⋆ graph search (A⋆). We call “agent” who is to learn to behave intelligently, and here, agent’s aim is to reach the goal. The size of the grid is 6 × 10 (see below). Agent starts at the leftmost cell in the bottom, that is, (6, 1). The goal is the rightmost cell in the bottom (blue), that is, (6, 10). All the cells with the green color refer to the regions with water. For the agent, the cost of each movement (action) in the white-colored cells (non-water region) is one, and the cost of each movement in the green-colored cells (water region) has the cost 5. All the cells between (6, 2) and (6, 9) is the cliff (red). If the agent enters the cliff, which means the agent falls into the cliff, then the agent will die. So the aim of the agent is to find a path to reach the goal cell alive from the start cell and the cost of the path should be as small as possible. Agent can move only one cell at a time to the neighboring cell, that is, up, down, right and left, unless the agent touches the border. When the agent touches the border, the action that makes the agent cross the border is not performed but it must remain stopped at the point waiting until the next action. For example, if the agent is at (1, 3) and the action is to up, then agent remains at that point, and if the next action is to right, then it moves to (1, 4), or when the next action is down then agent moves to (2, 3).

Grid pattern: