Exercise 1 The SimpleRooms Environment

THE SIMPLEROOMS ENVIRONMENT

In this exercise, you will examine one implementation of a grid world type environment.

Make sure that you have completed the setup requirements as described in the Set Up Lab Environments section.

Sign into your Azure Notebooks account at https://notebooks.azure.com, go to the library that you cloned for this course, and go to the **LabFiles** folder. We have provided several helper files and starter code for you.

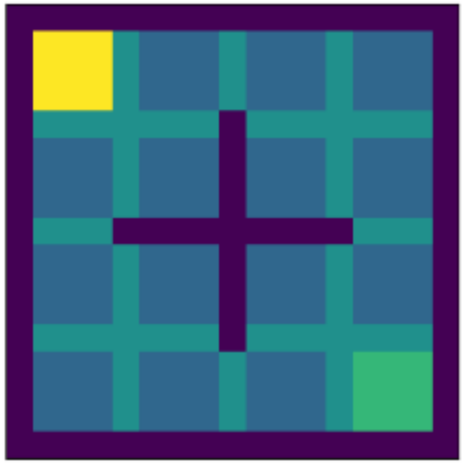
Let's start with the **lib\envs** folder. There are several files in that folder, including:

- simple_rooms.py
- cliff_walking.py
- bandit.py

Those are implementation of the several environments that we will use throughout this course. Open and examine the **simple_rooms.py** file.

The **Environment** class is provided as an interface. An environment must have some representation of the state of which the agent is interacting with. In addition, an environment must be able to reset it self and step to the next state. These are implemented in both the reset() and the step() function. The reset() function should return the initial state, while the step() function should take in an action and at the minimum, return the next state and the reward(). The actions() function maintains the information of how many type of actions in the environment. This is used in conjunction with the **ActionSpace** class.

Let's take a look at the **SimpleRoomsEnv** class, which implements the **Environment** class, and examine this in more details. The SimpleRoomsEnv is a simple environment of a 4x4 rooms, limited by walls. The initial state has the agent starting at the room on top left corner, with the goal to reach the room at the bottom right corner. Take some time to study the implementation of this environment. Start by examining how the states are represented in this environment. Also, look at how the SimpleRoomsEnv class implements the reset() and step() functions as these two are the ones used to interact with an agent.



Once you are familiar with the code, answer the following questions.

Lab Question

1/1 point (graded)

How many unique states does the SimpleRoomsEnv environment has? HINT: Take a look at the __init__() function.

- 0
- 1
- 2
- 4
- 16 ✔
- 48
- 256

Submit You have used 1 of 2 attempts

✔ Correct (1/1 point)

Lab Question

1/1 point (graded)

How is the states represented in the SimpleRoomsEnv environment? HINT: Take a look at the step() function and check how is state returned by that function.

- Using an integer between zero and the number of unique states
- Using an integer between zero and the number of unique states minus 1
- Using a sets of X, Y coordinates
- Using arrays of one-hot encoding ✔

Submit You have used 1 of 2 attempts

✔ Correct (1/1 point)

Lab Question

1/1 point (graded)

How many unique actions can an agent perform in the SimpleRoomsEnv environment? HINT: Take a look at the __init__() function.

- 0
- 1
- 2
- 4 ✔

Submit You have used 1 of 2 attempts

✔ Correct (1/1 point)

Lab Question

1/1 point (graded)

In the SimpleRoomsEnv environment, what is the reward given to the agent for each step taken, when the goal is not yet reached?

- -100
- -50
- -1
- 0 ✔
- 1
- 50
- 100

Submit You have used 1 of 2 attempts

✔ Correct (1/1 point)

Lab Question

1/1 point (graded)

In the SimpleRoomsEnv environment, what is the reward given to the agent, when the goal is reached?

- -100
- -50
- -1
- 0
- 1 ✔
- 50
- 100

Submit You have used 1 of 2 attempts

✔ Correct (1/1 point)

Lab Question

1/1 point (graded)

When will an episode ends in the SimpleRoomsEnv environment (when will the environment reset)?

- [ ] When the agent has taken 5 steps
- [x] When the agent has taken 50 steps
- [ ] When the agent hits a wall
- [ ] When the agent moves to one of the cliffs
- [x] When the agent has reached the goal
- [ ] When the agent has reached the goal 5 times
- [ ] When the agent has reached the goal 50 times

✔

Submit You have used 1 of 2 attempts

✔ Correct (1/1 point)