## Exercise 3 The Random Agent

## THE RANDOM AGENT

In this exercise, you will examine one implementation of an agent in the reinforcement learning setting.

The agent that you will examine is a random agent. It basically just acts randomly in the environment. For example, if the environment allows four different actions, then the agent will randomly execute one of those four actions, for each step it takes, in the environment. The goal of this lab is to show the construct of the environment, agent, and simulation, that we will use throughout this course.

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

Before we go to the Random agent implementation, let's examine the simulation.py file which is located under the lib folder. Here you will fine the Experiment class, which hosts the run\_agent() function, among other functions.

The run\_agent() function is where the simulation for the random agent will run. You can set the number of episodes you'd like to run.

* An episode starts when the agent take the first step in that episode.
* An episode ends when the agent reach a terminal state, whether it is the goal, or other terminal state(s) such as a cliff, or the maximum steps allowed per episode by the environment.
* Once an episode ends, the environment will reset, and the next episode will start.
* The simulation will end until the number of episodes you specified.

The run\_agent() function also captures the statistics of the resulting simulation and plots the necessary graphs to analyze the results. You can either view the result interactively, or upon completion. If you choose to view it interactively, make sure you only select a low number of episodes. Otherwise, the simulation may take a very long time. The Experiment class also contains other functions which will be used to run simulation for other modules.

Now, let's take a look at the random agent implementation.

1. Run jupyter notebook and open the “Ex1.3 Random.ipynb” notebook under Module 1 folder.
2. Examine the notebook. We have given you an implementation of a Random agent.
3. Once you have studied the notebook, run it (don't change any parameter), observe the results, and answer the following questions.