



OpenAI Gym: FrozenLakeEnv

In this lesson, you will write your own Python implementations of all of the algorithms that we discuss. While your algorithms will be designed to work with any OpenAI Gym environment, you will test your code with the FrozenLake environment.



Source: <http://eskipaper.com/images/frozen-lake-6.jpg>

In the FrozenLake environment, the agent navigates a 4x4 gridworld. You can read more about the environment in its corresponding [GitHub file](#), by reading the commented block in the `FrozenLakeEnv` class. For clarity, we have also pasted the description of the environment below:



winter is here. You and your friends were tossing around a frisbee at the park

when you made a wild throw that left the frisbee out in the middle of the lake.

The water is mostly frozen, but there are a few holes where the ice has melted.

If you step into one of those holes, you'll fall into the freezing water.

At this time, there's an international frisbee shortage, so it's absolutely imperative that

you navigate across the lake and retrieve the disc.

However, the ice is slippery, so you won't always move in the direction you intend.

The surface is described using a grid like the following

SFFF

FHFH

FFFH

HFFG

S : starting point, safe

F : frozen surface, safe

H : hole, fall to your doom

G : goal, where the frisbee is located

The episode ends when you reach the goal or fall in a hole.

You receive a reward of 1 if you reach the goal, and zero otherwise.

""""

The Dynamic Programming Setting

Environments in OpenAI Gym are designed with the reinforcement learning setting in mind. For this reason, OpenAI Gym does not allow easy access to the underlying one-step dynamics of the Markov decision process (MDP).

Towards using the FrozenLake environment for the dynamic programming setting, we had to first download the [file](#) containing the `FrozenLakeEnv` class. Then, we added a



```
# obtain one-step dynamics for dynamic programming setting  
self.P = P
```

The new **FrozenLakeEnv** class was then saved in a Python file **frozenlake.py**, which we will use (instead of the original OpenAI Gym file) to create an instance of the

[NEXT](#)