Artificial Intelligence : Lab Exercise 1

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1 Motivation

The notions of *agents* and *environments* are key in AI and be specified as follows:

- An agent interacts with the environment (informaly surroundings) by performing *actions*. The agent can also *perceive* (informally sense) the environment. In general, an agent is expected to choose its actions based on what it perceives/senses.
- The environment is described by its *state* (informatlly status/configuration), and it responds to the action of an agent by changing its state.

Please do look at https://github.com/aimacode/aima-python/ for example implementation of agents and environments.

We will look at the some simple examples of agent-environment interaction.

2 Bunny needs help

Bunny is drifting in the middle of the ocean, and it does not know the location of the shore. Assume that the world is 1-dimensional (shore could be left or right of the bunny), and come up a python implementation of a) environment and b) wise-bunny agent which reaches shore. In order to complete a) and b) you have to **identify states, precepts, actions and the wise-bunny's strategy**.

What happens if the world is 2-dimensional? How will you modify?

3 Vaccum Robot

Imagine a 2-dimensional world with each location described as $l = (x, y)$, where x, y are integers. There is dirt in a location $l_d = (x_d, y_d)$ and the vaccum robot has to start from location $l_s = (x_s, y_s)$. Come up a python implementation of a) environment b) wise-vr agent which picks the dirt.

The following example is to illustrate the importance of states internal to agents.

4 Count Words

Write a python code that uses only `f.read(1)` command that reads one character at a time from a text file to count the number of words in that file. Note that words in a sentence could be separated by multiple spaces.