**Assignment 1**

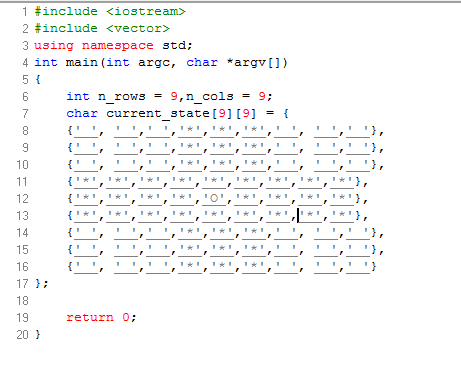
**Environments**

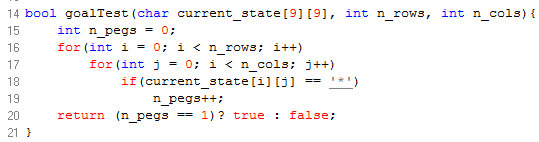
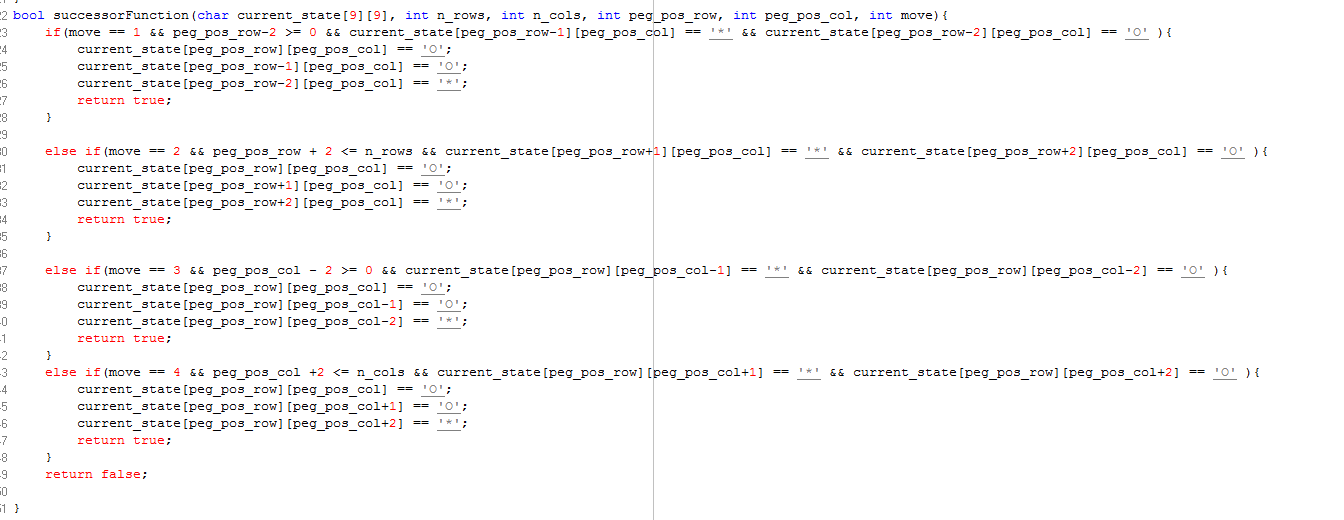
1. Partially observable environment: a satellite that monitors the weather around the world. It is partially observable because of the shape of the planet earth and the orbit of satellite that restrict the monitoring to at most half of the planet.
2. Stochastic environment: a table of black jack in which you don’t know the next card that will be dealt by the dealer, but you have a pretty much good idea of the probabilities of whether to keep going giving your cards on hand or by counting cards.
3. Sequential: a table of poker in which you need to base your bet with previous bets of your opponents to see whether it is worth it or not to continue betting.
4. Discrete: a line of production that have an image processing system for checking the quality of products. It has a finite number of state whether the current product analyzed is ready for sell or bad.
5. Static: the pegs logic game is a good example of a static example. In which there is no change to the board while you are trying to figure out your next move to reach the final goal.
6. Multi-agent cooperative: sending a troop of army robots to war. It is a multi-agent cooperative environments because the robots need to communicate with each other and reach their mutual share goal: winning the war.
7. Unknown environment: sending a robot to a planet in galaxy that is billion years away from ours in which our laws of physics as we know or the type of gravity or physical elements have never been encountered before by humans to try to develop an agent program that would deal with it in a systematic way.

**Agents**

1. The representation of the state of the game would be a 2D array that has N\*M dimension: N being the maximum number of rows and M maximum number of columns for every board variant at the sole exception of the triangular shape that will need to be rotated by 45 degrees to be accommodated by the 2D array. The holes would be represented by a (o) and pigs by a (\*) and the empty slots in the 2D array would be having empty or a space as content.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0 |  |  |  | \* | \* | \* |  |  |  |
| 1 |  |  |  | \* | \* | \* |  |  |  |
| 2 |  |  |  | \* | \* | \* |  |  |  |
| 3 | \* | \* | \* | \* | \* | \* | \* | \* | \* |
| 4 | \* | \* | \* | \* | O | \* | \* | \* | \* |
| 5 | \* | \* | \* | \* | \* | \* | \* | \* | \* |
| 6 |  |  |  | \* | \* | \* |  |  |  |
| 7 |  |  |  | \* | \* | \* |  |  |  |
| 8 |  |  |  | \* | \* | \* |  |  |  |

1. The operators of the game are: move up, down, right, and left a peg if and only if there is a hole after the pig adjacent to it.
2. 

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