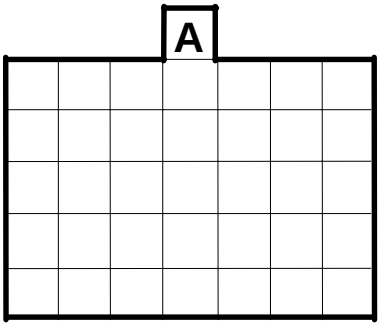
1.1 Consider the problem of designing a Web-based news-filtering agent that will periodically search one specified news site (e.g., Reuters) for stories matching a set of user-specified keywords. The agent can search through the site by following web links from page to page, starting from the home page. Matching is based on the number of keywords found in each news story. The user is then presented with a ranked list of links to matching stories that have not been read before.

(a) Describe the news-filtering agent in terms of its performance measure (or goals), environment, actuators (or actions), and sensors (or percepts).

(b) Briefly explain whether or not the environment is observable, deterministic, episodic, static, and discrete. State accordingly what type of agent is suitable and why. What other characteristics of this problem can you identify?

Note: clearly state your assumptions when answering the above questions.

1.2 Consider a simple reflex agent that is a robot operating in the grid environment shown hereafter. The robot's orientation is always parallel to the grid and its only actions are: move forward (1 square), turn left (in place), and turn right (in place). The robot starts in a random position and orientation and its goal is to reach the alcove A (it will automatically stop when there). For each of the following models of the robot, provide a set of condition-action rules that will achieve the goal from any possible initial state (hint: at most 4 should suffice), or else explain precisely why the task cannot be accomplished.



(a) A reflex agent with no memory and only one sensor to detect if there is a wall directly ahead of the robot.

(b) A reflex agent with no memory and two sensors to detect if there is a wall directly ahead and/or immediately to the right of the robot, respectively.

(c) A reflex agent with a single state memory and two sensors to detect if there is a wall directly ahead and/or to the right of the robot, respectively.