

Assignment 1

The online code repository <https://github.com/aimacode/aima-python/blob/master/agents.py> implements the vacuum cleaner environment. You can extend it to generate different shape rooms, obstacles, etc.

1. Implement a simple reflex agent for the vacuum environment discussed in the class (two locations A and B). Assume the agent percepts give it the clean/dirty status of every square in the environment.
 - (a) Run the environment with this agent for all possible initial dirt configurations and agent locations. Record the performance score for each configuration and the overall average score.
 - (b) Can this simple reflex agent be perfectly rational?
 - (c) Can you implement the same algorithm for larger environments (e.g., 3 squares, more linear squares)?
2. Consider the vacuum cleaner in (1) in an environment where its geography – its boundaries, the obstacles- is unknown. The initial dirt configuration is also unknown. The agent can move Up, Down, Right, and Left.

Implement a reflex agent with a randomized agent function.

3. The vacuum environments in the preceding exercises have all been deterministic. Briefly discuss possible agent programs for the following stochastic versions:

Murphy's law: twenty-five percent of the time, the Suck action fails to clean the floor if it is dirty and deposits dirt onto the floor if the floor is clean. How is your agent program affected if the dirt sensor gives the wrong answer 10% of the time?