

Problem Set 6.1: Due March 26

To prepare for this assignment, you should work through the Soar tutorial Parts 1 and 2. Most of the information in these parts of the tutorial have been covered in class discussion, but the tutorial provides a good review of the salient concepts.

For this assignment, you will create a Soar agent for the Eaters world. The overall goal is to eat all the food on any given map.

1. (10 points) Create a short readme indicating the approach or strategy your agent uses to eat food. Points here will be awarded on completeness of the description and on how well it actually matches the behavior produced by your agent. Be sure to clearly distinguish what you wanted to implement vs. what you actually implemented.
2. Below, pick some of features to implement in your eater. You can obtain a maximum of 65 points total, but full credit requires only 55 points. Be sure that your Readme clearly indicates which features you pursued.
 - (a) (5 points) Create an eater capable of moving around the map and eating all the food (if given infinite time). This means that the eater should not get stuck by generating infinite “state-no-change” impasses. It also means that you can use random motion to look for food.
 - (b) (5 points) Create an eater that tracks how much food it has eaten on its own. Every time it eats 10 more pieces of food, it should print the statement “I’ve eaten n pieces of food” where n is the **total pieces its eaten**
 - (c) (10 points) Create an agent that is capable of eating most of the food on the map in a short amount of time (without a lot of random wandering). Your agent should deliberately move toward locations that contain food when none is in view. You do not need to guarantee that all food will be eaten in finite time for full credit here, but be sure to clearly document the limitations of your approach.
 - (d) (10 points) Upgrade your agent so that it is capable of eating all the food on a map with no walls. (The map “open” can be selected in eaters to test your approach). Note that some methods you use to accomplish this task are relatively easy, but will not scale up well to the needs of later tasks. However, this task provides a safe fallback if you cannot achieve the full feature set.
 - (e) (10 points) Upgrade your agent so that before it resorts to random wandering to look for food, it takes a complete trip around the perimeter of the map. This won’t be of use for later tasks, but will get you some extra points...
 - (f) (15 points) Build on your previous agent so that your agent is *guaranteed* to eat all the food on any legal map without relying on non-deterministic (random) behavior. Clearly document how your approach works.
 - (g) (10 points) Modify your agent so that just before it eats the last piece of food, it prints the statement “This is the last bite remaining”. Note that to do this, the agent must recognize that no more food remains before it takes the bite! Also, note that the rule must fire before the command to move into the square containing the last bit of food is issued, since the game stops when no more food is left.