DEPARTMENT of COMPUTING
College of Business & Technology
EAST TENNESSEE STATE UNIVERSITY

CSCI 5260 – Artificial Intelligence

Lab 2 – Uninformed and Informed Search

Overview

You may want to review the code for search.py, in the aima-python repository for additional context.

Code Exploration

- Download the **search_examples.py** file from the D2L dropbox. This requires the following Python libraries (some of which you may need to install using pip install).
  1. os
  2. math
  3. numpy
  4. time
  5. collections → deque
  6. copy → deepcopy
  7. operator → itemgetter

Search Space and Environment

- Run the program and then answer the following questions:
  1. What is the search space for this problem as-is? Be sure to include the following:
     - Initial State
     - Actions
     - Transition Model
  2. Give a PEAS description for the searching agents in this example. Be sure to note any differences based on the algorithm. Performance Measure, Environment, Actuators, Sensors
  3. Give an environmental description of the searching agents in this example. Include the following:
     - Observability – Fully or Partially
     - Agent Type – Single or Multi
     - Deterministic or Stochastic
     - Episodic or Sequential
     - Static or Dynamic
     - Discrete or Conditinuous
     - Known or Unknown

Code Description and Performance

4. Describe the meaning of each character on the screen. What is a ".", a "C", an "X" and a "_"?
5. List the algorithms and the conditions used to run each, and then run each algorithm and record the runtime for each in your writeup document.
6. Which search algorithm performs best, and under which circumstances (e.g., when diagonals are allowed or not)? Which performs the worst? Why?

Updated Code

7. Alter the code to add a series of obstacles into the field of dots. Use asterisk characters to denote an obstacle. Each algorithm will need to avoid these obstacles, but still reach the goal.
8. List the algorithms and the conditions used to run each, and then run each and record runtimes in your writeup document.
9. Given your obstacles, document any observations that introducing the obstacles caused in the particular search algorithm. How did the behavior change?

Submission

Create a Word Document named SurnameLab2.docx with your responses above.

Submit your altered code in file search_examples.py.

Submit to the Lab 2 dropbox at or before Monday, February 1, 2021 by 11:59 PM.

Grading

A letter grade will be assigned for each response. The letter grades are based on both correctness and the adequacy of answers. Points are assigned as follows:

		A	B	C	D	F	Zero
		Excellent	Above Average	Average	Below Average	Poor	No Attempt
		10	8	6	4	2	0
Search Space and Environment	Q1						
	Q2						
	Q3						
Code Desc. & Performance	Q4						
	Q5						
	Q6						
Updated Code	Q7						
	Q8						
	Q9						