Assignment 1

Introduction to Artificial Intelligence and Logic Programming

Winter 2024

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## **Instructions**

* This is an individual assignment.
* Copying another person’s work is a breach of the academic integrity policy.
* Check eclass for due date and time.
* After completing this assignment, submit only the answer file.

**Do no alter the format of this answer file and do not omit any of the text in this file.**

**Part 1 – Uniformed Search**

**Question 1**

**Answer Format:** For the question below, type your answer in this format: **Start-A-B-C-D-E-F-Goal**. Do not explain your answer.

(Q.1.a) Depth-first graph search.

States Expanded (5 Marks):

Start-A-C-D-Goal

Path Returned (5 Marks):

Start-A-C-D-Goal

(Q.1.b) Breadth-first graph search.

States Expanded (5 Marks):

Start

A-B-D

C-D-Goal

Path Returned (5 Marks):

Start-D-Goal

(Q.1.c) Uniform cost graph search.

States Expanded (5 Marks):

Start(0)-A(2)

B(3)

D(5)

C(6)-D(7)

G(8)

Path Returned (5 Marks):

Start-A-C-G

**Question 2**

**Answer Format:** For the question below, type **True, False, Yes, or No** based on what the question is asking. Do not explain your answer.

**(Q2.a.1)** (5 Marks): true

**(Q2.a.2)** (5 Marks): true

**(Q2.a.3)** (5 Marks): true

**(Q2.a.4)** (5 Marks): yes

**(Q2.b.1)** (15 Marks)

**Answer Format:** List only the numbers, e.g., 1, 2, 3, 4, 5 then explain your answer for each item whether needed or not.

Answer:

4: necessary, to count how many visits has made so far for each of state. If the state which is being visited next has count of 2 in the array, this means that the goal is found.

1: unnecessary, the list of child nodes which are being inspected already gives enough information of the current location

2: unnecessary, this is not a problem to find the shortest path. Number of edges traversed means nothing.

3: unnecessary, this functionality is already included in the option #4. The count of 0 indicates the state is never visited, if it is greater than 0, the state is visited at least once.

5: unnecessary, this functionality is already included in the option #4. # of distinct states that has been visited = # of elements in the array that are not 0

**Part 2 – Informed Search**

**Question 3**

**Answer Format:** For the question below, type your answer in this format: **Start-A-B-C-D-E-F-Goal**. Do not explain your answer.

Returned Path (10 Marks):

**Question 4**

**(Q4.1)** (10 Marks):

**(Q4.2)** (15 Marks): **Answer Format:** Answer yes or no, then give a specific example to support your answer. Answering yes or not alone without a supporting example will receive zero marks.

1. The majority of this assignment is put together from material and questions provided by the authors of the textbook under an educational use license: All materials provided on this website are freely available for educational use <http://ai.berkeley.edu/instructors_guide.html> . [↑](#footnote-ref-1)