COMS 4701 - Homework 1 - Written

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Question 1

Performance: Response time, correctness

Environment: Bedroom, kitchen, office, lounge, noise, shelf, table

Actuators: Speakers, activation lights

Sensors: Microphones

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| --- | --- | --- | --- | --- | --- |
| **Environment** | **Observable** | **Agents** | **Deterministic** | **Static** | **Discrete** |
| Alexa | Partially | Single | Stochastic | Dynamic | Continuous |

Question 2

Initial State: Mars

Possible states: All possible paths of visiting (and collecting soil from) 0 to 5 continents

Possible actions: Visit and collect soil from a continent that has not been yet collected from

Transition model: updated list of collected soils

Goal test: Soil samples from Asia, North America, Africa, Europe, and Australia

Question 3

Note: The front of the queue is the left most letter.

Note: The top of the stack is the right most letter.

|  |  |
| --- | --- |
| **1 – BFS — Queue** | **2 – DFS — Stack** |
| S | S |
| A, B, C | C, B, A |
| B, C, D | C, B, D |
| C, D, E | C, B |
| D, E, H | C, E |
| E, H | C |
| H | H |
| F, G | G, F |
| G | G |
|  |  |
| Path: S-C-H-G | Path: S-C-H-G |
| Visit Order: S, A, B, C, D, E, H, F, G | Visit Order: S, A, D, B, E, C, H, F, G |

|  |  |
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| **3 – UCS — Priority Queue** | **4 – A\* — Priority Queue** |
| S | S |
| B2, C5, A6 | B3, C8, A11 |
| C5, E5, A6 | C8, E9, A11 |
| E5, A6, H7 | E9, A11, H14 |
| A6, H7 | A11, H14 |
| H7, D15, | H14, D24 |
| F9, G14, D15, | F9, G14, D24 |
| D13, G14 | G14, D18 |
| G14 | D18 |
|  |  |
| Path: S-C-H-G | Path: S-C-H-G |
| Visit Order: S, B, C, E, A, H, F, D, G | Visit Order: S, B, C, E, A, H, F, G |

Question 4

1. This is admissible

Question 5

1. This is admissible