

SUTD 50.021 AI

Week 01: Search

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Question 1 (Environment Types)

1. Playing an massively multiplayer online game, such as World of Warcraft

- Observable:
- Deterministic:
- Episodic:
- Static:
- Discrete:
- Single-agent:

2. Buying a movie ticket online

- Observable:
- Deterministic:
- Episodic:
- Static:
- Discrete:
- Single-agent:

3. Planning a holiday itinerary with your friends

- Observable:
- Deterministic:
- Episodic:
- Static:
- Discrete:
- Single-agent:

Question 2 (Formulation)

Three missionaries and three cannibals are on one side of the river. They all need to cross in a boat that only holds two people at once. There must never be a situation where there is a group of missionaries in one place who are outnumbered by cannibals.

Assuming they are crossing over from the left to the right side.

1. **Statespace:**

[Number of missionaries yet to cross, Number of cannibals yet to cross, Current Boat location (0: right side, 1: left side)]

2. **Initial state:**

Initially there are 3 missionaries and 3 cannibals who have yet to cross. The boat is on the left side.

[3,3,1]

3. **Goal test**

To obtain a goal state of **[0,0,0]** where there are 0 missionaries and cannibals who have yet to cross, hence implying all have crossed over. The boat is on the right side after ferrying the last group.

4. **Actions**

Actions are represented by [Number of missionaries crossing, Number of cannibals crossing, Where the boat is crossing from (0: right side, 1: left side)] Given the scenario, there are 5 possible actions: ([])

5. **Path cost**

Question 3 (General Search)

1. **Difference between a node and a state:**

A state which is a physical configuration does not have a parent, children, depth or path cost unlike a node which is a data structure constituting part of a search tree.

2. **Briefly describe what is a search strategy:**

Starting at an initial, root node of the search tree, a search strategy is the picking of the order of the node expansion.

3. **Describe the difference between Tree Search and Graph Search:**

During the node expansion, a tree search does not keep track of the previously visited states unlike a graph search.