50.021 – AI

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Week 01: Search

[The following notes are compiled from various sources such as textbooks, lecture materials, Web resources and are shared for academic purposes only, intended for use by students registered for a specific course. In the interest of brevity, every source is not cited. The compiler of these notes gratefully acknowledges all such sources.]

Due: 27th May, 11:59pm
Submission: via eDimension

1 Environment Types

There are six characteristics (Observable, Deterministic, Episodic, Static, Discrete, Single-agent) when describing a task environment.

TASK: For the following activities, describe the task environment using these six characteristics and state any assumotions you may have.

1. Playing an massively multiplayer online game, such as World of Warcraft (https://en.wikipedia.org/wiki/World_of_Warcraft)

2. Buying a movie ticket online

3. Planning a holiday itinerary with your friends

2 Problem Formulation

Missionaries and cannibals is a classical formal problem, and is generally stated as follows. 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.

TASK: Formalise the missionaries and cannibals problem in terms of its state space, initial state, goal test, actions and path cost.

3 General Search

TASK: Answer the following questions:

1. Describe the difference between a node and state.

2. Briefly describe what is a search strategy.

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