# Environment Types

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

|  |  |
| --- | --- |
| Environment Types | Assumption |
| Partially Observable | Player can only view their own character’s zone |
| Stochastic | The next state of the game might be affected by crit rate and damage ranges. The same action might have different outcomes |
| Sequential |  |
| Dynamic |  |
| Continuous |  |
| Multi Agent |  |

* 1. Buying a movie ticket online

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| --- | --- |
| Environment Types | Assumption |
| Fully Observable | User can view all the seats status |
| Deterministic | User cannot buy the same seat when other chose it and making payment |
| Episodic |  |
| Dynamic | When user is choosing the seat, other can choose the seat before you make the booking |
| discrete |  |
| Multi Agent |  |

* 1. Planning a holiday itinerary with you friends

|  |  |
| --- | --- |
| Environment Types | Assumption |
| Partially Observable | User is unable to view |
| Strategic | Different people might have different opinion on places to visit |
| Sequential | Users can go on a trip for different places in sequence |
| Dynamic |  |
| Continuous |  |
| Multi Agent |  |

# Problem Formulation

Assuming both missionaries and cannibals want to cross the river from the left side to the right side, and the boat is starting from the left side.

|  |  |
| --- | --- |
| State space | x, y, z each represent number of missionaries, cannibals, and boats respectively on the left side of the river |
| Initial state | (3,3,1) |
| Goal test | (0,0,0) |
| Actions | Either bring one cannibal, one missionary, 2 cannibals, 2 missionaries or one of each type to the other bank.  Example: Carry(x, y) where x and y represent the number of missionary and cannibal respectively  Carry (1,1)  Carry (0,2)  Carry (2,0)  Carry (1,0)  Carry (0,1) |
| Path Cost | Number of actions taken to reach the goal |

# General Search

* 1. Describe the difference between a node and state

Answer:

A node is a data structure constituting part of a search tree, containing states, parent node, child-nodes, action, path-cost and depth.

A state is a representation of a physical configuration in the state space

* 1. Briefly describe what is a search strategy

Answer:

Searching is a process of determining the sequence of actions that lead to the goal(solution) in a given problem. A search strategy is defined by picking the order of node expansion, based on the actions and transition model to create corresponding states. It is often evaluated based on its completeness, optimality, time complexity and space complexity.

* 1. Describe the difference between Tree Search and Graph Search.

Answer:

The difference between tree search and graph search is that, in graph search, we implemented an explored set which keep track of visited nodes, however, we do not keep track of nodes that were visited and expanded previously in tree search.