1. Environment Types

1.1 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	

1.2 Buying a movie ticket online

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	

1.3 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	

2. 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	$(x, y, z), with\ 0\ \leq x, y, z\ \leq 3$ 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

3. General Search
3.1 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

3.2 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.

3.3 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.