Topic: Searching Problem Formulation

1. Consider navigating a robot out of a maze. You can assume that the maze is drawn on a grid (think graph paper). The robot starts in the mizzle of the maze facing north. You can turn the robot to face north, east, south or west and have it move forwards a single square. If there is a wall in that direction the robot will not move.

   (a) Formulate the problem. How large is the state space?

   (b) From each intersection of the maze we can move in three or more directections and follow the corridor until another intersection is reached. Reformulate the problem using these actions. How large is the state space?

2. Consider the **missionaries and cannibals** problem: three missionaires and three cannibals are on one side of a river, along with a boat that can hold one or two people. The goal is to find a way to get everyone to the ohter side of the river without ever leaving a group of missionaries in one place outnumbered and that the boat must have someone on board to cross the river.

   (a) Draw a diagram of the complete state space.

   (b) Find a solution to the problem by following a path in your diagram of the state space.