CIS 630 assignment #2

Due: Oct. 3 (Wednesday) at class meeting.

Problem 1 – problem formulation.

Three missionaries and three cannibals find themselves on one side of a river with one boat. They 'd like to cross the river. Unfortunately the boat can only carry two people each time. Even worse, if the cannibals outnumber the missionaries on any side, then the cannibals will eat the missionaries. How can everyone cross the river safely?

1. What variables will you use to describe the problem in a computer? Try to use as small number of variables as possible.

2. How many states are in the solution space Ω? and how many are illegal?

3. Draw the graph in the state space with legal states being vertices and operators being edges.

4. How many distinct paths can you find to connect from the initial state to the goal state? Two paths are considered different if they have different lengths or order of states. Could the number be infinite?

Problem 2 – problem formulation.

Suppose you have two water jars, and you know that one is 4-gallon and the other is 3-gallon. Unfortunately the jars don't have measure marks. Suppose you have enough water to fill the jars as many times as you want. Now someone wants exactly two gallons of water in one jar. How can you accomplish it?

1. What variables will you use to describe the problem in computer? Try to use as small number of variables as possible.

2. How many states are in the solution space Ω?

3. What are the initial and goal states?

4. Draw a graph in the state space with legal states being vertices and operators being edges.

5. Then what is your solution?