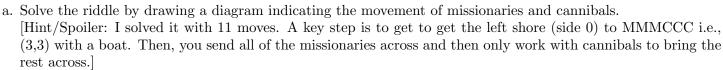
CSC 404 - ACTIVITY/PROJECT 1 - NAME:

Problem 1. On one bank of a river are **five** missionaries and **five** cannibals. There is one boat available that can hold up to **three** people and that they would like to use to cross the river. If the cannibals ever outnumber the missionaries on either of the river's banks, the missionaries will get eaten. How can the boat be used to safely carry all the missionaries and cannibals across the river? (Note - we also cannot have 2 cannibals and 1 missionary in a boat together.)



b. Represent the solution to the riddle as a state diagram. (Denote how you are encoding the information.)

Problem 2 (Bonus). Attempts at implementing a search algorithm (in a language of your choice) to construct a path from initial state to end state in the Farmer River Crossing Riddle or Missionaries and Cannibals Riddle?

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Problem 3. On one bank of a river are N missionaries and N cannibals. There is one boat available that can hold up to four people and that they would like to use to cross the river. If the cannibals ever outnumber the missionaries on either of the river's banks, the missionaries will get eaten. How can the boat be used to safely carry all the missionaries and cannibals across the river?
a. If $N=2$, how can the boat be used to safely carry all the missionaries and cannibals across the river? (Solve in 1 move)
b. If $N=2$ how can the heat be used to soful, comment the mission wing and compiled a cross the vivon? (Calve
b. If $N=3$, how can the boat be used to safely carry all the missionaries and cannibals across the river? (Solve in 3 moves)
c. If $N=4$, how can the boat be used to safely carry all the missionaries and cannibals across the river? (Solve in 5 moves)

d. If N = 5, how can the boat be used to safely carry all the missionaries and cannibals across the river? (Solve

e. (Bonus) Can you say anything in general? Are there any patterns/strategies that emerge?

in 7 moves)