

## Reasoning/Search Problem

Three IT Security Analysts - from now on just referred to as "analysts" - and three hackers are travelling together. Each of the analysts is carrying a flash drive containing incredibly sensitive passwords that the hackers would really like to steal.

As they are travelling together, they reach a river that they need to cross. The only way across is a canoe that can hold, at most, two people. They need to find a way to shuttle the six people across the river while keeping in mind the following constraints:

- The boat cannot cross the river by itself. Someone must be on board to row.
- For both banks of the river, if there are any analysts present on the bank, they cannot be outnumbered by hackers (if they were, the hackers would gang up on them to steal the flash drive).
  - In other words,  $N$  analysts can fight off  $N$  hackers but NOT  $N+1$  hackers (where  $N$  is a positive integer)
- When the boat pulls up to the shore it is considered "on the bank" even if someone stays on the boat and immediately rows back.
  - For example, if there is one analyst alone on one bank and the boat rows up with two hackers on it, that analyst is in danger EVEN if you decide to only get one hacker off the boat and send the other hacker back for more people.

Find a sequence of trips that can successfully get all 6 people across the river.

### Variation

Suppose that there are 5 analysts and 5 hackers (for a total of 10 people) but the boat can now hold three passengers at a time.

In this variation, the boat has the same constraint as the banks of the river. That is, a boat with 1 analyst and 2 hackers is illegal.

How can you get all 10 people across the river?