Problem 1: A Cat, a Parrot, and a Bag of Seed

A man finds himself on a riverbank with a cat, a parrot and a bag of seed. He needs to transport all three to the other side of the river in his boat. However, the boat has room for only the man himself and one other item (either the cat, parrot or seed). In his absence, the cat could eat the parrot, and the parrot would eat the bag of seed. Show how he can get all the passengers to the other side, without leaving the wrong ones alone together.

Define the problem:

The problem is that a man has a boat that is too small to transport all his belongings across a river at once. He can only transport one of three items at a time and if he takes the items out of order he may end up with an empty bag of seeds or a dead parrot. The goal is to get all items to the other side without compromise.

Break the problem apart:

The constraints are that only the cat and the bag of seed can be left alone together or else something bad may happen (or another way to say this is that the bird cannot be left with the other items). The goal is clear and there are no sub-goals to this problem.

Identify Potential solutions:

First solution: The man will take the bird with him first. He will then take the cat to the other side. He will take the bird back with him to the starting side and leave it there as he takes the seed. He will then go back finally for the bird. Second solution (similar to the first but the order of the cat and seed transfer reversed): Bird first. Then take the seed (instead of the cat this time). Bring the bird back on the trip for the cat (instead of the seed). Leave the bird again and take the cat to the destination and leave it with the seed. Finally go back for the bird.