Instructions:

1. Define the problem.
   1. Do this in your own words.
   2. What insight can you offer into the problem that is not immediately visible from the word problem alone?
   3. What is the overall goal?
2. Break the problem apart.
   1. What are the constraints?
   2. What are the sub-goals?
3. Identify Potential Solutions.
   1. For each of the sub-problems you’ve discussed in #2, what is a possible solution?
4. Evaluate each potential solution.
   1. Does each solution meet the goals?
   2. Will each solution work for ALL cases?
5. Choose a solution and develop a plan to implement it.
   1. Explain the solution in full.
   2. Describe some test cases you tried out to make sure it works. (You can include drawings and diagrams as part of your explanation as long as they are clearly communicating the solution).

**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.**

The initial problem is that the boat is too small to get everything he needs to the other side of the river. It is obvious that he is concerned about the safety of both the cat and the parrot, and that he has taken on the roll of caring for them. The fact that he is concerned about the seeds being eaten by the parrot, implies that it is equally important to him to be able to grow those seeds; so it is possible that he is in a survival situation where food is scarce. Ultimately the goal is to figure out how he can transport himself, the parrot, cat, and seeds safely and without having to leave any behind.

In breaking the problem apart the constraints are that the boat is too small, he is solely responsible for the welfare of the animals, the animals likely cannot be left alone for him to take more than one trip, one animal is a predator to the other and they cannot be left alone, he is unable to walk, and there is no one else there to help him.

Problem 2:

Problem 3: