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Web Programming Fundamentals – Online  
Problem Solving

A Cat, a Parrot, and a Bag of Seed

This problem involves a man who needs to get to the other side of the river with his cat, parrot and a bag of seed. The issue is he can only carry 1 item with him at a time. If he leaves the cat and the parrot together to bring the bag of seed across, the cat will eat the parrot. If he leaves the parrot alone with the seed then the parrot would eat all the seed while he is bringing the cat across.  
Some of the questions I have are, is the parrot in a cage or is a cage available to him? Can the cat be put into a cat carrier?  
The overall goal is to get the cat, parrot and the bag of seed safely to the other side of the river without leaving the wrong pets together or without leave the parrot alone with the seed.

The constraints to this problem is you are limited to only carrying one of the items with you each trip. You also cannot leave the parrot and the cat alone together and you cannot leave the parrot and the seed alone.  
The sub-goals would be to safely get the cat across the river, get the parrot across the river, and get the bag of seed across the river. Another sub-goal would be to keep the cat and parrot from being alone and keeping the parrot and the bag of seed from being alone.

A possible solution to get all three across the river without putting the cat and parrot together or the parrot and the bag of seed together alone is to do the following, for the first trip across the river bring the cat and have the parrot fly overhead and follow. When the man goes back across for the bag of seed have the parrot fly overhead again and follow him back across. Then load the bag of seed onto the boat and once again have the parrot fly overhead back to the other side following the boat.

In my opinion I feel that each solution I came up with meets the goal of getting the cat, parrot and bag of seed across the river.

The first task of bringing over the cat and have the parrot fly overhead is a possible solution that will work as long as the parrot listens to the man and follows him. If the parrot chooses to stay back then the bag of seed is gone. If the parrot chooses to stay back on the other side of the river with the cat then the cat could eat the parrot. When the man goes back to get the bag of seed as long as the parrot followed the man back to the other side then the parrot will follow him back to the other side where the cat is.

To achieve the goal of getting the cat to the other side of the river and have the parrot follow overhead would be to put the cat in the boat and grab a hand of seed. Get the parrot to fly overhead and as a reward give the parrot a little bit of seed. To get the parrot to fly back to the other side use the same handful of seed to lure him back over.

I didn’t do any type of test cases. I went through the problem in my head and then made some notes about it and changed the solution until I was happy with the results.

Socks in the Dark

The problem is trying to match up socks in your drawer while it is dark in the room. You have 5 pairs of black socks, 3 pairs of brown socks and 2 pairs of white socks. The goal is to pull out the least amount of socks to get a matching pair.

The overall goal is to get a pair of matching socks.

The constraints are it is dark in the room. You also have 3 different colors of socks to choose from. A sub-goal would be to not have any unmatched socks.

To achieve at least one matching pair of socks you would need to pull out 5 socks at a minimum. If your first sock is black, the second one could be brown and the third would be white. There are still two more to grab. The odds are better that you will grab one of those 3 colors with the next two attempts. To get at least on of each color as a pair, you would need to pull out seven socks.

I think the solution does meet the objectives to complete the task. The solution will work as long as we only have the three-color choices. If another color sock is added to the mix it could though off the results.

The get a pair of socks that match pull out the first sock, seeing as how it is dark out, you will need to grab all three samples first. This result could give you a case of confusion. After the first three samples are pulled, go ahead and pull out two more socks.  
To get at least one matching pair of each sock would require the removal of 7 socks. When you remove the seven socks that are not matched you could end up collecting at least one of each color.