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Web Programming Fundamentals

Problem Solving

Problem 1

1a. A man needs to get his cat, parrot and a bag of seed across a river using a boat that will only hold himself and one passenger. The problem is that the cat can’t be left alone with the parrot, and the parrot can’t be left alone with the seed.

1b. It doesn’t say anything about how many trips it has to take and there is no way to only make 3 trips without leaving an incompatible pair together on one side or the other.

1c. The overall goal is to get everything to the other side of the river and keep it all intact.

2a. The constraints for this problem would be the fact that the man can only take 1 other item with himself in the boat at a time and that the cat cannot be left with the parrot and the parrot cannot be left with the seed.

2b. The sub-goals would be to not just get everything across the river, but to not have the cat eat the parrot or the parrot eat the seed.

3a. The possible solutions for the sub-problems that were previously identified would be to not leave the cat and the parrot alone and to not leave the parrot and the seed alone. You could take the parrot across first and the cat and the seed would be fine together, until your second trip then you would end up with a pair that would not work. Another solution would be to take the parrot across, followed by the seed, but then bring the parrot back with you and take the cat across next. On the final trip you would then bring the parrot back.

4a. The first solution would not meet the goals because after making two trips you would be left with an incompatible pair on one side. The second solution, however, would work out well because by moving the parrot across twice, none of the incompatible pairs would be left alone together.

4b. The first solution will not work at all. The second solution will work for all cases.