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Web Programming Fundamentals

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 man needs to transport all three (parrot, cat, seed) to the other side of the river but he can only take one at a time. If the man would put the parrot on my shoulder strap the seed to my back and put the cat in the spot that only has room for one more. The man’s goal is to get everything to the other side of the river. The man only has room for one animal or bag of seed. Sub goals are if the man leaves the parrot with the seed will he eat the seed or if he leaves the cat with the parrot will the cat eat the parrot. The man can leave the cat with the seed for a possible solution. There is only one solution I can think of that requires taking one passenger. That is leaving the cat with the seed and taking the parrot across the river first. The man could try taking two or even three at once if it’s possible. If it was me I would try to take at least two or three at once. It would require less trips and save time. I diagnosed a good resolution in my second sentence of this paragraph. If the man strapped the seed to his back, carried the parrot on his shoulder then place the cat in the available space for one passenger then that would work. He could even leave the cat and take the other two.

Socks in the Dark:

There are 20 socks in a drawer: 5 pairs of black socks, 3 pairs of brown and 2 pairs of white. You select the socks in the dark and can check them only after a selection has been made. What is the smallest number of socks you need to select to guarantee getting the following:

1. At least one matching pair  
   b) At least one matching pair *of each color.*

I need to get one matching pair and one matching pair of each color from picking out the smallest number of socks to reach those results. Its possible to get all three colors in a smaller selection of socks but to guarantee results; then you would have to gather all 20 socks. Overall constraints are picking the socks out in the dark. Sub goal would be picking out the pairs with a smaller selection. Picking out eight socks should get you one matching pair but to get a matching pair of each you would have to at least pick 16. The first and second solution meet the goals but still have a chance to fail. It’s not a 100% guarantee. There is nothing to say I have to pick out the socks in the dark. If I remove that constraint then I can easily pick out one matching pair and three matching pairs of each color by choosing eight socks.

Predicting Fingers:

A little girl counts using the fingers of her left hand as follows: She starts by calling her thumb 1, the first finger 2, middle finder 3, ring finger 4, and little finger 5. Then she reverses direction, calling the ring finger 6, middle finger 7, first finger 8 and thumb 9, after which she calls her first finger 10 and so on. If she continues to count in this manner, on which finger will she stop?

a) What if the girl counts from 1 to 10 b) What if the girl counts from 1 to 100 c) What if the girl counts from 1 to 1000