Problem Solving

Web Programming Fundamentals

Laurie Shuck

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1. a) A man needs to use his boat to take two animals and seeds across a river. He needs to take them in a certain order to prevent the animals from fighting or eating the seeds.

b) I am curious as to why the parrot cannot ride on the man’s shoulder. Also, how big is the bag of seeds, and how could the parrot eat the seeds if the seeds are in a bag?

c) The goal is to get all of them across the water on a boat, without leaving the animals alone together, or leaving the wrong animal alone with the seeds.

2. a) The constraints include that the cat and parrot cannot be left alone together, and the parrot and the seeds also cannot be left alone together.

b) The subgoals for this problem are that the animals should not be allowed to fight, and the parrot should not be allowed to eat the seeds.

3. a) Some of the possible solutions include taking the parrot first, so the cat and the seeds are alone. Or, he can take the cat first and make sure that the parrot cannot eat the seeds. Finally, the man can take the seeds, and place the parrot in a location that the cat cannot reach.

4. a) Each solution could meet the goals if nothing unexpected occurred. However, since Murphy’s Law usually holds true, I would have to narrow down the solution to the man taking the parrot first.

b) No, each solution would not work for all cases because the man does not want to leave the cat alone with the parrot. In addition, he also does not want to leave the parrot with the bag of seeds.

5. I believe that the man should take the parrot first. Next, he should take the cat, and as he is travelling back across the water to pick up the seeds he should take the parrot. He can leave the parrot on the shore, and transport the seeds, and then return again to pick up the parrot. I drew a diagram showing which animals should go next to make the final solution clear.

1. a) There are 20 socks in a drawer, and a matched pair needs to be located in the dark. There are 10 black socks, 6 brown socks and 4 white socks, so I need to determine how many times I have to pull socks of the drawer until I find a matching pair.

b) There are only 3 colors of socks, so it would not take long to find a match.

c) The goal is to pull socks of a drawer until I find a matching pair while being in the dark.

2. a) The constraints are that it is dark, and I have to pull random socks.

b) The subgoal is to figure out how many times I need to pull socks out of the drawer.

3. Some of the solutions are to turn on the light, to take the drawer to a light-filled room, or to pick socks out of the drawer until I find a matching pair.

4. a) All of the solutions would help to resolve the problem.

b) All solutions would work for all cases. Shining light on the sock drawer would definitely work, and so pulling socks out of the drawer would also work.

5. I would pull the socks out of the drawer until I found a matching pair since light was not mentioned as a solution.

a) To find one matching pair, I would remove four socks from the drawer since there are only a total of three colors of socks. After I pull out the first four socks, I should have a matching pair.

b)

1. a) This problem involves a girl counting on her left hand, using a specific numbering system, and I need to find out what finger she will land on after counting on her fingers a certain number of times.

b) The answer is given for the first question, and that’s it.

c) The goal is determine which finger the girl will land on when counting with her fingers.

2. a) The largest problem that I foresee is trying to figure out how to solve this problem. For that reason, a constraint could be trying to find the pattern or formula required to solve this puzzle.

b) As I mentioned in my last answer, I believe that a subgoal is to identify the pattern or formula, which can help you solve the puzzle.

3. I have already tried to solve this puzzle, so I will be writing the ideas that I have tried. A possible solution is to count the numbers on your fingers until you find the answers. Also, you could create a chart to try to pinpoint which finger will be landed on.

4. a) You could attempt to count to 1000 with your fingers, but you could also lose count. The chart that I created was helpful, but did not help me locate the answer because I did not want to make a chart up to 1000.

b) The chart would definitely work if someone wanted to write it out. I also believe that the finger-counting method would not work because it is difficult to count in this way without losing track.

5. As I mentioned earlier, I attempted to figure out this problem, but I ran out of time. I think that you can divide the number by 8 and the remainder will identify the fingers position, however, I am not quite sure. I also noticed that the first finger and ring finger are even numbers. My solutions are as follows:

a) 10 would land on her first finger

b) 100 lands on her ring finger

c) This is the question that I had a tough time with. According to my chart, it would land on her ring finger or the first finger, so I am going to guess the ring finger.