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WPF – Problem Solving

I. A Cat, A Parrot and A Bag of Seeds.

1) Define the problem:
   a. This person has to cross the riverbank and he has brought with him two animals and an item: a cat, a parrot and a bag of seeds. The problem lies in that he can't leave any of the three alone with each other because they would either eat each other or the bag of seeds. Another problem is that you can only bring one other passenger with you.
   b. My first insight is to empty the bag of seeds unto the floor so I can wrap the cat in it so that the parrot would be safe. Then I thought how difficult it would be to carry all those mini seeds in my arms. After that I though, "why not drop the seeds unto the boat?" Then how am I going to keep the seeds safe from the parrot when I'm taking him to the other side of the riverbank? Another though was, "why not take the seeds first but what if the cat also eats seeds?"
   c. The overall goal is to transport all 4 us to the other side without mixing the wrong elements together
2) Break the problem apart:
   a. There are multiple constraints in this puzzle. First of, we have the fact that there can only be one other passenger besides the man. Second, the parrot and the cat are natural enemies so you can't leave them alone and the same goes with the parrot and the seeds. Thirdly, we have the lack of information and how the mind will compensate by making up solutions to things that aren't there.
   b. The sub-goals are to find the one animal or thing that runs the less risk of getting eaten and use that as a stepping-stone. Since the cat and the parrot are natural enemies then the sub-goal would be to erase them from the equation at least until we come up with a good start for the puzzle. The third sub-goal would be to focus on the information given and to not assume too much.
3) Identify potential solutions:
   a. A possible solution would be to use the bag of seeds as the centerpiece of the problem. Since the parrot and the cat are not to be alone then I think they should not be in the equation.

4) Evaluate each potential solution:
    a. This solution does indeed meet the goals for it's the only element in the puzzle not affected by outside sources.
    b. Probably not considering this is a solution for the main problem.
5) Choose a solution and develop a plan to implement it:
    a. First we take the parrot and take it over the riverbank. Then we come back and take the bag of seeds. Settle it down, we turn around with the parrot, settle him down and take the cat over the river next to the bag of seeds. Now all we have to do is come back for the parrot and the puzzle is solved.
    b. I made a small diagram and tried the possibilities there which each element at the helm as if they were more important than the other.

II. Socks in the Dark

1) Define the problem:
    a. The problem here is that you have 20 socks and you have to make selections of the smallest number of socks so you can successfully get 1 matching pair and one matching par of each color. This is all done int the dark and you cannot see your selection until you have made one.
    b. The puzzle doesn't say if the socks are all identical or not. So maybe you can slide by touching them and kind of hoping they are not the same fabric.
    c. The overall goal here is to solve this puzzle using skills and concepts learned in class based on problem solving.

2) Break the problem apart:
    a. The main constraint is that you have to make selections in the dark. Second, the socks are paired but not in even numbers. Third, there are 3 sets of colors to choose from.
    b. The subgoals is to find the mathematical equation to better your probabilities of getting one matching pair or a matching pair of colors.
3) Identify Potential Solutions:
    a. If all of the socks are neatly put in one drawer then one possible solution would be to vary from where you pick so that your chances are high. Same goes with a drawer that has been divided so that each probability has its own cubicle. What also you could do is to feel all the socks and try to match or pair those socks that have the same fabric texture. You can also try to match socks that have the same thickness.

4) Evaluate each potential solution:
    a. Each solution given shares the same goal which is to try and grab pairs of socks and pairs of matching colors. This is no easy task since all you have to do is try to grab socks in the dark and the only way to confirm is to look AFTER you have made your selection which in a way helps to narrow it down.
    b. No, because the odds for each one vary and as you keep getting socks out the odds change.
5) Choose a solution and come up with a plan to implement it:
    a. I honestly can't come up with a mathematical solution, however, I can offer a logical one based on touch. As soon as you make your first 2 choices just deduce from that your chances to come up with your pairs.

III. Predicting Fingers

1) Define the problem:
    a. The problem is that this girl has a weird and unconventional way of counting with her fingers. This makes the revealing of patterns very confusing. Also, since most people use their index finger as a one count, the girl's way of counting makes it hard to focus.
    b. Since her way is very unconventional I can tell from the get go that it won't be easy to find patterns.
    c. The overall goal here is to predict on which finger she will land when you count (her way) to 10, 100, and 1000.
2) Break the problem apart:
    a. The principal constraint is the girl's unusual way of counting. Another is the fact that after the ten count it doesn't specify if she continues on from the index figure or she counts eleven with her thumb.
    b. First subgoal is to establish a pattern or some clue as to how to easily figure out which finger she lands on. Another option is to do the good ol' finger count yourself and try to not lose count.
3) Identify potential solutions:
    a. A possible solution for this problem would be to look for someone with a similar method of couting and asking aobut it so as to discover a better solution. You can also draw over your fingers and then just try out her method for those who are visual.

4) Evaluate each potential solution:

a. Yes, each solution meets its goal which is to predict on which finger will we end up if we use the girl's counting method.

b. Yes, because each solution is focused on predicting the finger. However there are outside factors like getting confused and counting on the wrong finger and using the wrong pattern.

5) Choose a solution and develop a plan to implement it:

a. The solution that I think its best for this problem is as follows: I noticed that, counting the way she does, every time she passes the index fingers is one count of 10 and when she gets to the ring finger the next two turns end there. For the 1 to 100 count is the same thing so I can deduce that for the 1 to 1000 is also the same pattern therefore I can say with certainty she will end on her index finger everytime she counts from 1 to 10, to 100 and to 1000.

b. Visually it's like this: Index - 1, 2 ,3 ,4 5, 6, 7, 8, 9, **10**. Ring Finger - 11, 12, 13, 14, 15, 16, 17, 18, 19, **20**, 21, 22, 23, 24, 25, 26, 27, 28, 29 and **30**. This is what I did for figuring out the pattern.