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Scalable Data Infrastructures

A Cat, a Parrot, and a Bag of Seed:

1. Define the problem

In this problem it seems that you cannot carry the parrot, the cat, and the bag of seeds over to the other side of the river at the same time. An even bigger problem is that you cannot leave the cat and the parrot alone or the parrot and the seeds alone. So the goal is to get the bird, the cat and the seeds across without losing one.

1. Break the problem apart

The constraints in this are that you cannot leave the parrot alone with the seeds because it will eat them but you cannot leave the cat with the parrot because the cat will eat the parrot. Another problem is that you can get the parrot across the water but then you can’t take the cat or the seeds over second because you will lose the parrot or the seeds.

1. Identify Potential Solutions

To solve this problem the man would have to make multiple trips back and forth. He would have to make sure not to leave the parrot alone with the cat or the seeds; the parrot is the key to this solution. So the parrot would have to go on multiple trips with the man.

1. Evaluate each potential solution

I believe that this solution could meet the goals. It will be like having your cake and eating it too.

1. Choose a solution and develop a plan to implement it

To get each passenger across safely you would first have to start with taking the parrot across the river. Then you would have to take the seeds with you on the second trip. Upon dropping the seeds off you would then need to take the parrot back with you across the river. Once on the other side, drop off the parrot and pick up the cat. Once you drop the cat off go back to the other side and get the parrot and bring him across the river. If the plan is implemented correctly none of the wrong passengers will be left together and everyone will get across the river safely. I’ve drawn this out on paper to make sure that this would work and I’ve gone over it in my head many times. I do believe it is full proof.

Socks In The Dark:

1. Define the problem

You need to have the right kinds of socks but you have no light to view what you are grabbing in your sock drawer. There seems to be no limit on how many times you can try this sock conundrum but let’s try to get it on the first time. So, our goal is to get a pair of each kind of sock and to get a least one matching pair.

1. Break the problem apart

The constraint in this problem is that we cannot view our socks as we are grabbing them out of the drawer. We can only view them afterwards. Since, we have 2 goals in this (get at least one matching pair and one pair of each) we need to come up with 2 different solutions

1. Identify Potential Solutions

A solution to get at least one pair is to get 4 socks. At 3 socks you have a higher possibility of getting no pairs at all because there are 3 different colors. To get a pair of each we will need anywhere from 7 to 10 socks.

1. Evaluate each potential solution

The solution to get at least one pair does meet the goals I believe. The other solution to find a pair of each might need to be downsized.

1. Choose a solution and develop a plan to implement it

To find at least one pair of the socks you would need to get at least 4 socks because if you got 3 socks you run the chance of getting one of each color. As for getting a pair of each you will need to grab at least 8 socks. 6 and 7 socks would be too few to grab because you most likely will not get a pair of each. With 8 socks you will have the best chance at the least amount of socks grabbed to get a pair of each.

Predicting Fingers:

1. Define the problem

The problem in this is that it is not practical to count on your finger to 1000 to figure out what finger the girl will land on. Sure you could count to 10 yourself or even to 100 but to go beyond that is impractical. So, the goal in this is to figure what fingers the girl is landing on at 10, 100, and 1000.

1. Break the problem apart

The constraint in this problem is that what solution you have to get to 10 will not work for 100 or 1000 so you have to figure out each one individually. A sub-goal would be that we have to figure out the pattern that would lead us to the solution.

1. Identify Potential Solutions

A possible solution would be to use excel to work out the problem so that you can view it step by step in front of you. It has the ability to extend the existing pattern that you have. With the problem laid out clearly and visually in front of you, then the solution is sure to surface.

1. Evaluate each potential solution

Yes the solution does meet the goals. The solution must be adjusted for each problem because the pattern changes slightly.

1. Choose a solution and develop a plan to implement it

Through excel I was able to lay out the problem visually so that I could get a better look at what was going on. To find what finger 10 lands on you can also just simply count on your fingers and it leads to the index finger. Every 10 numbers it either lands on index or ring finger but it goes in a pattern.