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SDI 00

Problem Solving

**1. A Cat, a Parrot, and a Bag of Seed.**

**Define the Problem**

1. A man had a cat, a parrot, a bag of seed. He needs to get them across the river without losing any of them! The boat can only carry the man and one other item So, how will the man get them all across the river?
2. The cat eats parrots, the parrot eats seeds, the seeds eat nobody!!
3. To get everything across the river.

**Break the problem apart**

1. The constraints are that the cat will eat the parrot and the parrot will eat the seed.
2. The sub goals are to keep the parrot and seed from being eaten.

**Identify potential solutions**

1. The cat and the seed can be alone together, so the parrot should travel across first.

**Evaluate each potential solution**

1. The solution does meet all goals.
2. I don’t know if it works for all cases, but in this case the parrot should definitely go first.

**Choose a solution and develop a plan to implement it**

1. The man needs to carry the parrot across the river first, leaving the bag of seed and cat alone together on the other side.
2. The man can then make other trips for the seed and the cat that were previously alone.

**2. Socks in a Drawer**

**Define the Problem**

1. There are 20 socks in a drawer: 5 pairs of black socks, 3 pairs of brown and 2 pairs of white. What’s the least amount of socks needed to be drawn blindly to grantee the results of at least one matching pair and one matching pair of each color.
2. There is an even number of socks
3. To get a matching pair, and a pair of matching colors.

**Break the problem apart**

1. The constraints are that there are both left and right socks, as well as in different colors.
2. The sub-goals are to find the different results possible based on matching right and left. Next is to see how many color possibilities there are.

**Identify potential solutions**

1. Select the amount of socks for the wrong hand (10). I assume once all these are drawn I have to draw a matching sock next.
2. Doing the same with color we see that 18 failed draws will give me the possibilities of no matches. So the 19th draw will give me a match

**Evaluate each potential solution**

1. The solution does meet all goals.
2. This will work for all cases like this.

**Choose a solution and develop a plan to implement it**

1. 11 socks drawn will give you at least one matching pair.
2. 19 socks will give you at least one matching pair in each color.

**3. Predicting Fingers**

**Define the Problem**

1. A girl counts across her fingers starting with 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. So we need to figure out which finger she stops on in each case.
2. Certain fingers are ‘odd’ and some are ’even’.
3. To be able to determine which finger the girl will finish on

**Break the problem apart**

1. The constraints are that we can’t count to a thousand or a million if need be.
2. The sub-goal is to find a solution that allows us to figure out which finger she will land on.

**Identify potential solutions**

1. Find an a number 1-10 that the number is divisible by. Find the finger to find a finger with multiples of this value. Using this number we can find the finger based on its numerical ‘value’.

**Evaluate each potential solution**

1. The solution does meet the goal.
2. The solution works in all cases

**Choose a solution and develop a plan to implement it**

1. 1 to 10. Thumb.
2. 1 to 100. Thumb
3. 1 to 1000. First Finger

Since 1000 is divisible by 8 and this represents the first finger she will land on her first finger.