A Cat, a Parrot, and a Bag of Seed

1. Define the problem
   1. The man has to transport a cat, a parrot, and a bag of seed to the other side of the river using his boat. The boat can only hold himself and one other item.
   2. It appears that it doesn’t matter how many trips the man has to make.
   3. The intention is to get every item successfully across the river.
2. Break the problem apart
   1. The constraints consist of having to get all of the items across the river.
   2. The sub-goals consist of making sure the cat doesn’t eat the parrot, and the parrot doesn’t eat the bag of seed.
3. Identify potential solutions
   1. Potential solutions:
      1. The man could make three trips across the river. He would take the parrot first. He would then take the bag of seed. Followed last by the cat.
      2. The man could make three trips across the river. He will take the parrot first, take the cat second, and take the bag of seed last.
      3. The man could take one of the three items and leave the other two items behind.
4. Evaluate each potential solution
   1. The first solution meets the goals. It gets all of the items across the river without losing any of them.
5. Choose a solution and develop a plan to implement it
   1. I’m going to go with my first solution.
      1. Man makes three trips across the river. First trip he takes the Parrot. Second trip he takes the Bag of Seed. Third trip he takes the Cat.
   2. Here’s an example I drew out to represent this case:

Cat

Parrot

BoS

Eats

Eats

Socks in the Dark

1. Define the problem
   1. There are twenty socks in a drawer and you have to select at least one matching pair. Find a way to effectively pair the socks up.
   2. A pair of socks includes two individual socks.
   3. To find a matching pair of socks. Also to find a matching pair of each color.
2. Break the problem apart
   1. Constraints:
      1. How many pairs there are of each color. In this case that’s 5 black, 3 brown, and 2 white.
      2. Having to find a match.
   2. Sub-goals:
      1. Finding a matching pair.
      2. Finding a matching pair of each color.
3. Identify potential solutions
   1. Some possible solutions:
      1. Pull every sock from the drawer.
      2. Pull socks until you get a match. Then pull more socks until you get another color match.
      3. Pull a select number to ensure a match of two different colors.
      4. Pull ten socks.
4. Evaluate each potential solution
   1. Does each solution meet the goals?
      1. This solution does meet the goal. It may not be the most efficient; however, it does work.
      2. This solution will work.
      3. This solution may work some of the time.
      4. This will ensure at least one match.
   2. Will each solution work for ALL cases?
      1. This solution will work in every instance. It will be the least efficient method.
      2. This solution will work but it may be the slowest method to achieve the necessary effect.
      3. This solution may pull matches; however, it may not.
      4. It will pull one match; however, may not pull all of the matches.
5. Choose a solution and develop a plan to implement it.
   1. The solution I’m going with is pulling every sock in the drawer. This method is foolproof. It will ensure you pull a match of each type of sock. It may be the least efficient; however, it is the most thorough.
   2. Since every sock is being pulled it is guaranteed to work.

Predicting Fingers

1. Define the problem
   1. Counting fingers from 1 to 10, 1 to 100, and 1 to 1000. Determining what finger will be stopped on at each respective number.
   2. There has to be a way to count each number without manually doing it.
   3. The overall goal is to determine what finger will be represented by 10, 100, and 1000.
2. Break the problem apart
   1. Constraints:
      1. The order switches after each 5th finger.
   2. Sub-Goals:
      1. Number on finger 10
      2. Number on finger 100
      3. Number on finger 1000
3. Identify potential solutions
   1. Some possible solutions:
      1. Manually count out each finger until you reach the necessary number.
      2. Count until I find a pattern and then base my answers off of that pattern.
      3. There has to be an easy arithmetic equation to figure this out but I can’t come up with it.
4. Evaluate each potential solution
   1. Does the solution meet the goals?
      1. This will eventually work it just takes a very long time.
      2. Yes.
      3. Unsure.
   2. Will this solution work in all cases?
      1. Yes it will, it will take a long time though.
      2. Yes it should.
      3. Unsure.
5. Choose a solution and develop a plan to implement it
   1. The solution I found that worked for me was the second choice. I counted out until I found a recurring pattern. I found that in intervals of ten the number landed on either the second or fourth finger.
   2. The pattern went 10 on the second finger, 20 and 30 on the fourth finger. Followed by 40 and 50 on the second finger again. Using this I was able to estimate that 100 would appear on the fourth finger. I was also able to determine that 1000 would appear on the second finger.