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Web Programming Fundamentals  
Problem Solving

A cat, a parrot, and a bag of seed

1. Define the problem

a. The problem is a man is transporting the cat, parrot, and bag of seed across the river but can only transport one item at a time.

b. How long will it take to cross the river?

c. The overall goal is to get all three across the river without leaving the wrong ones together.

2. Break the problem apart

a. The constraints are the boat is too small the man can only take one item at a time.

b. The sub-goals are not leaving the wrong ones together when the man leaves.

3. Identify potential solutions

a. Take the bird first because the cat won’t do anything to the seed.

4. Evaluate each potential solution

a. Does each solution meet the goal? Yes

b. Will each solution work for all cases? Maybe

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

a. Solution in full: Take the parrot first, return and take the cat, then take the parrot back with him when he returns, leaves the parrot, and takes the seed and leaves it with the fox, then once he returns he then takes the parrot across.

b. test cases.

Socks In the dark

1. Define the problem

a. The problem getting a matching pair of socks in the dark and getting a matching pair of socks in each color in the dark..

b. My insight that is not immediately visible

c. The overall goal is to get matching socks.

2. Break the problem apart

a. The constraints its dark and you need matching socks  
 b. The sub-goals are getting a matching pair of socks and getting a matching pair in each color.

3. Identify potential solutions

a. Take out 4 socks, you might have a match?

4. Evaluate each potential solution

a. Does each solution meet the goal? Yes

b. Will each solution work for all cases? Maybe

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

a. Solution in full: You have a three different colors of socks so if you pull out 4 socks you might get a match. Otherwise a simple solution to this problem is to fold your laundry.

b. test cases.

Predicting Fingers

1. Define the problem

a. The problem is figuring out what finger the girl would land on for 10, 100, and 1000;

b. Insight that is not immediately visible.

c. The overall goal is to figure out what finger the girl will land on.

2. Break the problem apart

a. The constraints are

b. The sub-goals are counting fingers

3. Identify potential solutions

a. Start counting.

4. Evaluate each potential solution

a. Does each solution meet the goal? Yes

b. Will each solution work for all cases? Maybe

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

a. Solution in full:

1 1 thumb  
2 2 Index finger  
3 3 middle finger  
4 4 ring finger  
5 5 little finger  
6 6 ringer finger  
7 7 middle finger  
8 8 Index finger  
9 9 thumb  
10 2 Index finger  
11 3 middle finger  
12 4 ring finger  
13 5 little finger  
14 6 ringer finger  
15 7 middle finger

A complete cycle starting at thumb = 1 ends at thumb = 9. So you add 8 each time you return to the thumb. So you only need to deal with the remainder after dividing by 8. For 123456789 the remainder after dividing by 8 is 5 and that corresponds to the little finger.

http://cplusplusexpert.blogspot.com/2011/09/puzzle-finger-counting.html

b. test cases.