**A man finds himself on a riverbank with a cat, a parrot and a bag of seed. He needs to transport all three to the other side of the river in his boat. However, the boat has room for only the man himself and one other item (either the cat, parrot or seed). In his absence, the cat could eat the parrot, and the parrot would eat the bag of seed. Show how he can get all the passengers to the other side without leaving the wrong ones alone together.**

Our goal is to get everything to the other side of the river without leaving certain items together. The constraints are: the bird and can’t can not be left alone, nor can the parrot and the bag of seed. In a situation like this I can only think of a single solution.

1. The man brings the parrot over

2. He goes back to get the bag of seed

3. He drops the bag of seed off and takes the parrot

4. He drops the parrot of on the original side and takes the cat

5. He drops the cat off to be with the seed

6. He goes back to get the parrot

7. He brings the parrot over and now they are all on the other side

**There are 20 socks in a drawer: 5 pairs of black socks, 3 pairs of brown and 2 pairs of white. You select the socks in the dark and can check them only after a selection has been make. What is the smallest number of socks you need to select to guarantee getting the following:**

**a) At least one matching pair**

**b) At least one matching pair of each color**

Our goal here is to find out the probability of selecting a matching number of socks. The constraints are: the fact that it is dark and we can’t see until we select, there are 10 black socks, 6 brown socks and 4 white socks. I did some research on the internet, and am not very good at probability in general, as in coming to a formula for it. I am going to try and work it out verbally. We know there are 10 black socks, and 10 of another color. After picking 10 socks, I would think you would have a 50% chance of selecting a black sock. And after 16 you would have at least one matching pair of each color.

**A little girl counts using the fingers of her left hand as follows: She starts by calling her thumb 1, the first finger 2, middle finger 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. If she continues to count in this manner, on which finger will she stop?**

**a) What if the girl counts from 1 – 10**

**b) What if the girl counts from 1 – 100**

**c) What if the girl counts from 1 – 1000**

For this I resorted to using some JavaScript to make a program that did the counting for me. This was really my first attempt at using programming to solve a problem of my own so I couldn’t get it exactly how I wanted it.

I made a function called *handCount*

function handCount(index) {

for(var I = 0; I < index; i++) {

if ((I – 1) % 8 == 0) {

console.log(i)

}}}

Whatever number this popped out last would be on the thumb, and I would just count out the rest from there.

a) From 1 – 10 would equal the pointer finger

b) From 1 – 100 would equal the ring finger

c) From 1 – 1000 would equal the pointer