Jacob Collins

10/30/14

Web Programming Fundamentals- Sec. 1

Problem Solving

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

1. The man needs to get the cat, parrot, and the bag of seed across the river without endangering the parrot or the seed. By leaving the parrot, the cat could eat the parrot and by leaving the seed, the parrot could eat the seed. The overall goal is to get all three across the river without conflict.
2. If the man leaves the parrot and the cat, but takes the bag of seed, the cat could eat the parrot. If the man leaves the parrot and the seed, but takes the cat, the parrot could eat the bag of seed.
3. Possible solutions to this man’s issue are deciding what to leave and what to take. Since the man has limited space on the boat and can only take one item at a time, he must decide which is most important. A possible solution would be to place the cat in the bag of seeds and take both of them at the same time since they would house the same amount of room. Likewise, the man could hold the cat and take the bag of seed with him while leaving the parrot for a second trip.
4. The solutions meet the goals and would work because they do not leave the objects together that would conflict.
5. If the man takes the bag of seeds with him and holds the cat, the parrot is left alone and would not be eaten by the cat. In addition, the parrot would not be able to eat the seeds left by the man. When the man returned for the parrot, the cat would have no interest in the seeds and thus would leave them be.

**Socks in the Dark**

1. There are 20 socks in the drawer and we need to select at least one matching pair of socks and a matching pair of each color. There are five pairs of black socks, three pairs of brown socks, and two pairs of white socks. A problem that might arise from this issue is the likelihood of probability working in one’s favor.
2. The constraints of this assignment are the different colors of socks present in addition to the lack of a light source to select the sock colors you want. In order to obtain the right sock colors to create one matching pair, as well as a matching pair for each color, we must determine the probability of doing so.
3. Potential solutions to the issue would be to invest in a light that would allow you to see the color socks you select. Joking aside, we must mathematically determine the probability that the socks you select would be the colors you needed. For example, for the black socks, there is a 50% chance that you would select this color because there are 10 black socks. There is a 30% chance you would select the brown socks, which leaves a 20% chance you would select the white socks. The smallest number you would need to take out of the drawer would be two socks in order to get one pair of matching socks. In order to get one pair of matching socks from each color, you would need to take out at least six socks.
4. The solution doesn’t necessarily meet the goals in the selection of socks since there is a probability you would not select a matching color within two tries, nor would you be able to select one pair of matching socks for each color in six tries.
5. Random selection of the socks does not equate to a solution, as probability creates an issue in the selection process. The best solution would be to take all of the socks and select the pair that you want. Another solution would be to pair the socks together so one can select two at a time, allowing the selector to have concrete knowledge that they’ve selected at least one pair of matching socks.

**Predicting Fingers**

1. The girl is counting on her fingers starting with her thumb as number one. When she reaches the little finger, which is the number five, she then starts at the number six using her ring finger. She continues to count in this manner going back and forth from one side of the hand to the other
2. Issues that might arise from counting using one hand are the loss of one’s place in counting. If the child is counting and gets distracted, they would have to start over again because the numbers do not have a designated number assigned to them. The goals are defined by determining which finger the child will stop on if she counts to 10, 100, and 1000.
3. Possible solutions for the child in determining which finger she will land on would be to allow the child to count to nine, which would bring her back to the thumb, and then add eight to each “run” of the fingers.
4. The solutions meet the goal because they allow the child a faster solution of determining which finger she would land on for 10, 100, and 1000 rather than counting all the way to the higher numbers.
5. For example, in the case of counting to 10, the child only has to add one more because the thumb’s number is determined to be 9, thus placing the 10 on the index finger. In the case of 100, we can count upwards from the thumb by 8 after it is given the value of 9 thusly: 9, 17, 25, 33, 41, 49, 57, 65, 73, 81, 89, and 97. After reaching 97, we can than count upwards three more spaces and determine the number 100 would land on the ring finger. By counting to 1000, we can determine that since 97 places us on the thumb, doing that set 10 more times would place 970 as the number for the thumb and then we can continue up by 8 again: 978, 986, and 994. After reaching 994 as the number for the thumb, we could then count off the remaining six numbers and place the 1000 marker on the middle finger.