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

**Problem:**

The problem is both one of incompatibility and space. The cat traveling with a bird, cat in a boat surrounded by water, and the bird would likely eat the seed to be transported. Spatially the boat is just too small, in either case this would be problematic at best. Yet we desire to move all items to the other side of the river.

**Break down:**

Incompatibles, bird and seed, cat and bird, water and cat.

A spatial problem as the boat is too small.

And one potentially frustrated man.

Identify solutions:

1. Move the birdseed to the other side of the river for the bird, go back for the cat losing only the seed. Of course this assumes we did want the seed in the future.
2. Feed the seed to the bird, feed the bird to the cat, and somehow calm the cat enough to give a boat ride to the other side. Assuming the cat doesn’t freak-out.
3. Use something to secure both the cat and bird separately away from each other, and then just make multiple trips securing each away from each other on the other side. This might be the best option and assumes items are well secured.

**Evaluate:**

Solution 1: Losing only the seed, and only having to cross the river three times. This is optimal if your will to lose the seed and assumes there isn’t much seed. And has some worry of securing the cat, and bird in ones absence.

Solution2: Feeding might be the most expedient method to make only one crossing, and secures at least the cat. Assuming the seed, and bird are not that important this is likely to be the fastest solution.

Solution 3: We initiate the problem of securement and sacrifice time via multiple trips for one item. The biggest worries here are time and if in ones absence the animal escapes. Beyond the problem of securement and time this is a good plan.

**Develop the best plan:**

Decide between speed, and all items:

As securement risks animal escaping, and is very time consuming I went with speed. The seed and the bird are replicable--time is not. Let the feeding begin… This solution has the best chance of both working and saving time.

*Socks in the Dark:*

**Problem:**

Finding a matching pairs of socks in the dark is a statistical probability issue so finding out the maximum number one can get wrong is the only question.

Finding a matching pair of each color is still a statistical probability issue, and the obvious answers will ensue.

**Break down:**

We’re in the dark for no good reason and desire matching socks in a drawer of colored socks. We also want one matching set of each color.

Identify solutions:

1. Take them all incurring the bulk of socks to carry, yet were guaranteed matching sets. No thought involved and is the fastest way.
2. We could take 18 socks so if per chance we miss a pair of white socks there will still be at least one pair of white socks. Only slightly less bulk but requires a little more time.
3. The bad plan, taking 16 pairs has a high probability of having a matching set of each color. The bulk is yet slightly less, takes the same time as #2.

**Evaluate:**

Solution 1: This is the fastest, mostly likely to work, and only incurs more to carry.

Solution2: Slightly less bulk but requires some actually thought. If one is willing to sacrifice some time to save a pair for home this would be an optimal option.

Solution 3: We save a little more space by only taking 16 socks, the odds are with us, but only if were willing take that risk.

**Develop the best plan:**

Our goal:

The point I believe is finding one pair of each color and thus the minimum number of socks. So option three is based on gambling so it won’t work, option one is not the minimum number but would work. Option two is clearly the answer with the guaranteed minimum being 18 socks.

**Evaluate:**

Solution 1: Losing only the seed, and only having to cross the river three times. This is optimal if your will to lose the seed and assumes there isn’t much seed. And has some worry of securing the cat, and bird in ones absence.

Solution2: Feeding might be the most expedient method to make only one crossing, and secures at least the cat. Assuming the seed, and bird are not that important this is likely to be the fastest solution.

Solution 3: We initiate the problem of securement and sacrifice time via multiple trips for one item. The biggest worries here are time and if in ones absence the animal escapes. Beyond the problem of securement and time this is a good plan.

**Develop the best plan:**

Decide between speed, and all items:

As securement risks animal escaping, and is very time consuming I went with speed. The seed and the bird are replicable--time is not. Let the feeding begin… This solution has the best chance of both working and saving time.

*Predicting Fingers:*

**Problem:**

Figuring out which figure one a count she will stop on when counting to 10, 100, 1000. This is more a problem of patterns than probability.

**Break down:**

Figuring out which finger the count will stop on. There isn’t much to elaborate on here.

Identify solutions:

1. Count till reach the desired number, although this is time consuming.
2. Identify the pattern to arriving at the ending count

Evaluate:

Solution 1: This is often guaranteed to work, but is very time consuming counting to the end of 1,000.

Solution 2: Finding a pattern is definitely the fastest way although it incurs a bit more thought. However after the initial time investment of thought is done it can be reused to any count we desire and quickly.

**Develop the best plan:**

Deciding between a guaranteed yet slow counting process, and finding a pattern I went with time needed to reach the answers. I used excel to figure this out in a spreadsheet fashion:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **pinky** | **ring** | **middle** | **pointer** | **Thumb** |
| 5 | 4 | 3 | 2 | 1 |
|  | 6 | 7 | 8 | 9 |
| 13 | 12 | 11 | **10** |  |
|  | 14 | 15 | 16 | 17 |
| 21 | **20** | 19 | 18 |  |
|  | 22 | 23 | 24 | 25 |
| 29 | 28 | 27 | 26 |  |
|  | **30** | 31 | 32 | 33 |
| 37 | 36 | 35 | 34 |  |
|  | 38 | 39 | **40** | 41 |
| 45 | 44 | 43 | 42 |  |
|  | 46 | 47 | 48 | 49 |
|  |  |  | **50** |  |

At 10 she reaches the pointer finger.

At 100 she reaches the ring finger.

At 1000 she reaches the ring finger.