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**SDI**

A cat, a parrot, and a bag of seed

Define the problem

a)

I need to get all the objects across the river, all while carrying no more than one object at a time.

b)

The only two things that can be together at the same time is the cat and the seed.

c)

The overall goal is to move all three of the objects from one side of the river to the

other.

Break the problem apart

a)

The constraints are:

The parrot

The cat

The seed

b)

The sub-goal would be to prevent all of the objects from perishing.

Identify potential solutions

a)

To keep the cat from eating the parrot and the parrot from eating the seed those two combinations need to be avoided.

Evaluate  each  potential  solution

a)

Yes, each solution meets the goals.

b)

Yes, each solution works for all cases.

Choose  a  solution  and  develop  a

plan  to  implement  it.

a)

Since the cat can be left with the seed then the parrot should be transported first.

Then the seed could be brought over.

The parrot would then be taken back across so that it would not eat the seed.

The parrot could then be dropped off and the cat would be picked up.

Once the cat and the seed are both on the opposite shore the parrot could be

picked up and taken across.

b)

I imagined that I was the person trying to move these objects across the river and came up with the solution fairly quickly from there.

Socks in the dark

Define the problem

a)

I want to obtain a matching pair of socks in the dark without having to pull out to many.

b)

There are only 3 different colors of socks. White, Black and Brown.

c)

To obtain a matching pair of socks while pulling out as few socks as possible.

Break the problem apart

a)

The constraints are:

5 pairs of black socks

3 pairs of brown socks

2 pairs of white socks

Equaling a total of 20 socks

b)

Could not identify a sub-goal.

Identify potential solutions

a)

For question a) If four socks are pulled out of the drawer then that would be the least amount possible, because of there only being three different colors of socks.

For question b) It stands to reason that if four socks is the amount of socks that it takes to obtain one pair that eight would provide one pair of each color.

Evaluate each potential solution

a)

For a) It does meet the goals.

For b) It has met the goals out of five attempts.

b)

Both solutions do not fulfill all cases.

Choose a solution and develop a plan to implement it.

a)

For a) Since there are only three different colors of socks the first sock pulled out could be one of three colors. The second sock pulled out would either match the first one or be one of two colors. The chances of the third sock being a different color is very slim but still possible, so a fourth sock is removed from the drawer to ensure that there is at least one match made.

For b) Within the twenty socks there are ten black socks, six brown socks and four white socks. Since there only being four white socks the possibility of getting a pair would be 4/16, relatively low compared to the six brown 3/7, and ten black 1/2.

b)

Below I have attached a picture of the experiment I did to test my theory. 