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Problem Solving

A Cat, a Parrot & a Bag of Seed

1. Define the problem
   1. In your own words. A cat, a parrot and a bag of seed need to be transported across a river by a gentleman who only has room in his boat for one of these items. He must decide which one will ride in his boat and figure out a way to get the other two across. He is also concerned the cat may eat the goat and the goat may eat the cabbage.
   2. What insight can you offer into the problem that is not immediately visible from the word problem alone? The goat and the cabbage appear to be a distraction by the author because it is unlikely a cat could eat a goat unless the cat in question was a large feline like a tiger or lion. Also, there is nothing that states he can’t make more than one trip.
   3. What is the overall goal? The goal is to transport all three objects across the river without leaving the wrong ones behind.
2. Break the problem apart
   1. What are the constraints? First, there is only room for one object (cat, parrot, seed) in the boat. There is a concern that the cat may eat a goat if left behind. There is another concern that the goat may eat cabbage if left behind.
   2. What are the sub-goals? Prevent the goat and the cabbage from being eaten.
3. Identify potential solutions
   1. For each of the sub-problems you’ve discussed in #2, what is a possible solution? Tie up the goat with something it can’t chew through so it won’t eat the cabbage and transport the cat across the river first. Then return for the parrot. And make a third trip for the seed. Make a fourth trip for the cabbage and release the goat before leaving.
4. Evaluate each potential solution
   1. Does each solution meet the goals? The cat and the goat seem to pose the most issues so securing the goat in order to remove the cat first seems to make the most sense. Transporting the cabbage was not a goal; however, since it seems important to keep it away from the goat, transporting it across the river seems like a viable solution. Although, birds generally like eating seeds so it might make sense to transport the cabbage before the seeds so the parrot won’t get to it while the man is en route for the cabbage.
   2. Will each solution work for ALL cases? Yes.
5. Choose a solution and develop a plan to implement it
   1. Explain the solution in full. First, secure the goat with something he can’t chew through like a chain. Hide the seed from the parrot. Transport the cat across the river first. Return for the parrot. Then collect the cabbage and transport that across the river. Finally, put the seed in the boat, release the goat and make your way across the river with the seed.
   2. Describe some test cases you tried out to make sure it works.

Socks in the Dark

1. Define the problem
   1. In your own words.
   2. What insight can you offer into the problem that is not immediately visible from the word problem alone?
   3. What is the overall goal?
2. Break the problem apart
   1. What are the constraints?
   2. What are the sub-goals?
3. Identify potential solutions
   1. For each of the sub-problems you’ve discussed in #2, what is a possible solution?
4. Evaluate each potential solution
   1. Does each solution meet the goals?
   2. Will each solution work for ALL cases?
5. Choose a solution and develop a plan to implement it
   1. Explain the solution in full.
   2. Describe some test cases you tried out to make sure it works.

Predicting Fingers

1. Define the problem
   1. In your own words.
   2. What insight can you offer into the problem that is not immediately visible from the word problem alone?
   3. What is the overall goal?
2. Break the problem apart
   1. What are the constraints?
   2. What are the sub-goals?
3. Identify potential solutions
   1. For each of the sub-problems you’ve discussed in #2, what is a possible solution?
4. Evaluate each potential solution
   1. Does each solution meet the goals?
   2. Will each solution work for ALL cases?
5. Choose a solution and develop a plan to implement it
   1. Explain the solution in full.
   2. Describe some test cases you tried out to make sure it works.