

EGR115 Exercises

Problem Solving

Use whatever resources you need to determine the information necessary to prepare the following algorithms:

1. Suppose you have a set 10 of boxes on a table. Eight of the boxes are empty, but in one of the boxes is a **peach** and in another box is an **apple**. You would like to swap the peach and the apple – have the apple be where the peach is currently and have the peach end up being where the apple is currently. Unfortunately, you've broken one arm and cannot hold both of them concurrently. To avoid contamination, the fruit should never be placed anywhere other than a box. Provide a written ENGLISH description of the process for swapping the contents of the two boxes. This English description would be considered an algorithm.

2. Prepare an algorithm for making the perfect cup of coffee - 1 cup water, 1 tsp instant coffee, 3 packets sweetener, 1 tsp creamer - with the final cup of coffee at 180°F.

4. Prepare an algorithm for changing the starter in an automobile. Be sure it handles different types and brands of car and engine configurations. As you figure this out, keep notes and describe the process you underwent.

5. Prepare an algorithm for finding the surface area of a mountain. As you figure this out, keep notes and describe the process you underwent.

6. Prepare an algorithm for computing the final charge at a store (as a cash register does).

7. Prepare an algorithm that will control a Roomba.