1. Define a shopping list ADT

2. Which of the following recursive "algorithms" will correctly "compute" the desired result. If not, explain why not

   a. to sort a list of integers
      algorithm sort (int start, int end) // start and end are indices
         . if start == end, return // its sorted
         . find the minimum value of the array
         . exchange the minimum value with array[start]
         . sort(start+1,end)
         . return

   b. to sort a list of integers
      algorithm msort(start,end)
         . msort(start,(start+end)/2)
         . msort((start+end)/2+1,end)
         . combineSortedArrays(start,(start+end)/2,(start+end)/2+1,end)
         . return

   c. to find average of an array of integers
      algorithm avg(start,end): returns int
         . if(start > end) return 0
         . x = avg(start,(start+end)/2)
         . y = avg(start+end)/2+1,end)
         . return (x+y)/2

3. Write a "complete" java class for the shopping list ADT defined above. In this case, "complete" means to include declarations for the different methods, including parameters and return types, but do NOT actually insert code to implement the methods.

4. Write a complete Java program to compute the sum of the first N positive integers. Your program should accept "N" as an input value. Thus if the user when asked for a positive integer typed "6", your program would print the result "21" (1 + 2 + 3 + 4 + 5 + 6).