Darek Konopka

4/28/2021

CS-102

Dr. Sarah Sutton

1)(2 points) A recursive solution that finds the factorial of n generates \_\_\_\_\_\_ recursive calls

a.n-1

b.n

**c.n+1**

d.n\*2

2)(2 points) In the ADT list, when an item is deleted from position i of the list, \_\_\_\_\_\_.

a. The position of all items is decreased by 1

b. The position of each item that was at a position smaller than i is decreased by 1

**c. The position of each item that was at a position greater than i is decreased by 1**

d. The position of each item that was at a position smaller than i is increased by 1 while the position of each item that was at a position greater than i is decreased by 1

3)(6points) What are the three perspectives, or levels, with which we deal with ADTs?

* **Application** (or user or client or external) level: We use the ADT to solve a problem. When working at this level we only need to know how to create instances of the ADT and invoke its operations.
* **Abstract** (or logical) level: Provides an abstract view of the data values (the domain) and the set of operations to manipulate them. At this level, we deal with the “what” questions. What is the ADT? What does it model? What are its responsibilities? What is its interface?
* **Implementation** (or concrete or internal) level: Provides a specific representation of the structure to hold the data and the implementation of the operations. Here we deal with the “how” questions.

4)(10 points) Write a recursive method that takes a String parameter and prints out the characters of the string in reverse order.

**Code starts below here:**

/\*  
 \*Name: Darek Konopka  
 \*Date: 04/28/2021  
 \*Question: Number 4  
 \*Description: This program uses recursion to print a string backwards  
\*/  
  
public class ReverseOrder {  
  
 // Method that reverses the order of the string  
 public static String reverseString(String str)  
 {  
 // If the input is null, then we just return the string  
 if (str.isEmpty())  
 {  
 return str;  
 }  
 // Call the function again and again until we are done  
 return reverseString(str.substring(1)) + str.charAt(0);  
 }  
   
 public static void main(String[] args) {  
   
 // Here we create a string, then call the reverse string function  
 String str = "Lets make this backwards";  
 String reversed = reverseString(str);  
 System.out.println("The input string is: " + str);   
 System.out.println("The reversed string is: " + reversed);  
 }  
}

**OUTPUT**

