CCC2113 Data Structures and Algorithms Analysis   Name:

Lab 1: Algorithm Complexity (4/4/2024)   Group:

Question 1: Find the frequency count of each statement in the following code segments when executed:

1.1

1 public class PrintArray {	1
2 public static void main(String[] args) {	1
3 // Declare and initialize an array of integers	
4 int[] numbers = {1, 2, 3, 4, 5};	1
5	
6 // Iterate through the array and print each element	
7 System.out.println("Integers stored in the array:");	1
8 for (int i = 0; i < numbers.length; i++) {	n+1
9 System.out.println(numbers[i]);	n
10 }	
11 }	
12 }	

Total Frequency: 2n+5= 15 n=5

1.2

1 public class PrintArray {	1
2 public static void main(String[] args) {	1
3 // Declare and initialize an array of integers	
4 int[] numbers = {1, 2, 3, 4, 5};	1
5	
6 // Call the a function to print array elements	
7 System.out.println("Integers stored in the array:");	1
8 printArray(numbers, 0); // Start with index 0	1
9 }	
10	
11 // Function to print array elements	
12 public static void printArray(int[] arr, int index) {	n+1
13 // Base case: if index reaches the array length- stop	
14 if (index == arr.length) {	n+1
15 return;	1
16 }	
17	
18 // Print the element at the current index	
19 System.out.println(arr[index]);	n
20	
21 // Recursive call to print the next element	
22 printArray(arr, index + 1);	n
23 }	
24 }	

Total Frequency: 4n+8

1.3

1	`static void printArray(int n) {`	1
2	`    java.util.Random random = new java.util.Random();`	1
3	`    int[] numbers = new int[n];`	1
4		
5	`    // Fill the array with random numbers`	
6	`    for (int i = 0; i < n; i++) {`	n+1
7	`        numbers[i] = random.nextInt(100);`	n
8	`    }`	
9		
10	`    // Print the elements of the array`	
11	`    System.out.println("Random numbers in the array:");`	1
12	`    for (int i = 0; i < numbers.length; i++) {`	n+1
13	`        System.out.println(numbers[i]);`	n
14	`    }`	
15	`}`	

Total Frequency: 5n+6

1.4

1	`static void printRandomArray(int n) {`	1
2	`    int[] numbers = new int[n];`	1
3	`    fillRandom(numbers, 0);`	1
4		
5	`    // Print the elements of the array`	
6	`    System.out.println("Random numbers in the array:");`	1
7	`    printArray(numbers, 0);`	1
8	`}`	
9		
10	`static void fillRandom(int[] arr, int index) {`	n+1
11	`    if (index == arr.length) {`	n+1
12	`        return;`	1
13	`    }`	
14	`    java.util.Random random = new java.util.Random();`	n
15	`    arr[index] = random.nextInt(100);`	n
16	`    fillRandom(arr, index + 1);`	n
17	`}`	
18		
19	`static void printArray(int[] arr, int index) {`	n+1
20	`    if (index == arr.length) {`	n+1
21	`        return;`	1
22	`    }`	
23	`    System.out.println(arr[index]);`	n
24	`    printArray(arr, index + 1);`	n
25	`}`	

Total Frequency: 9n+11