

CO225-Apr2025 : Software Construction

Lab 02 : Java Basics II

Question

Sheldon's Magic Number Detector

In The Big Bang Theory, Sheldon believes the number 8 is “the perfect symmetrical infinity.” He started writing a Java program to filter numbers containing the digit 8. Unfortunately, Sheldon got distracted by an argument with Leonard about string theory and left the program incomplete.

Your Task :

You must help Sheldon complete his program to:

1. Read positive integers from the user until -1 is entered (maximum 100 inputs)(because we did not cover Collections(ArrayLists) in the CO225 Perusall activities just yet).
2. Find and store numbers that contain the digit 8 in a separate array.
3. Compute and print the sum of those numbers.
4. Sort that filtered array in descending order.
5. Print the result in [a1, a2, ..., an] format.

Constraints:

- Use only primitive arrays (int[])
- Max 100 inputs

```
import java.util.*;

public class MagicEightTool {
    public static void main(String[] args) {
        final int SENTINEL = -1;
        final int MAX_SIZE = 100;
        // like I mentioned last week, we can use “final” keyword

        Scanner in = new Scanner(System.in);
```

```

int[] input = new int[MAX_SIZE];
int count = 0;

// Read up to 100 positive integers
System.out.print("Enter a positive integer (or -1 to end): ");
int number = in.nextInt();
while (number != SENTINEL && count < MAX_SIZE) {
    if (number > 0) {
        input[count] = number;
        count++;
    }
    System.out.print("Enter a positive integer (or -1 to end): ");
    number = in.nextInt();
}

// 1. Filter numbers containing digit 8
int[] filtered = new int[count];
int filteredCount = 0;
for (int i = 0; i < count; i++) {
    if (hasEight(input[i])) {
        filtered[filteredCount] = input[i];
        filteredCount++;
    }
}

// 2. Compute sum

// 3. Sort filtered numbers in descending order

// 4. Print the final array and sum
}

// Check if number contains the digit 8
public static boolean hasEight(int number) {
    // TODO

```

```
// don't worry too much about what is public what is static
// we will cover them with OOP, cause it would make much more
// sense there,
// BUT
// if you are curious :)
// you can find out what are they and why are they there,
// on your own    }

// Print array in [a1, a2, ..., an] format up to given size
public static void printArray(int[] array, int size) {
// TODO
}

// Sort array in descending order (only up to 'size' elements)
public static void sortDescending(int[] array, int size) {
// TODO
}
}
```