NailedBoard

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import java.util.*;
import java.util.Arrays;

public class NailedBoard {

    public static void main(String[] args) {
        // Read the input data and sort it.
        Scanner input = new Scanner(System.in);
        System.out.println("\n Hi, please type the total number of wood pieces
in the first line, and the height of each pieces on the second line.");

        int n = input.nextInt();
        int[] data = new int[n];
        ArrayList<int[]> myData = new ArrayList<>();
        ArrayList<Integer> freq = new ArrayList<>();

        for (int i = 0; i < n; i++) {
            data[i] = input.nextInt();
        }
        Arrays.sort(data);

        // Identify different values and their frequencies.
        for (int i = 0; i < n; i++) {
            int occur = 1;
            boolean same = true;
            while (same) {
                if (i < n - 1 && data[i + 1] == data[i]) {
                    occur = occur + 1;
                    i++;
                } else
                    same = false;
            }
            int[] a = new int[2];
            a[0] = data[i];
            a[1] = occur;
            myData.add(a);
        }

        //Calculate the height for every possible pair of wood pieces.
        for (int i = 0; i < myData.size() - 1; i++) {
            int[] current = myData.get(i);
            if (current[1] > 1) {
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                for (int k = 0; k < current[1] / 2; k++)
                    freq.add(current[0] * 2);
            }

            for (int j = i + 1; j < myData.size(); j++) {
                int[] next = myData.get(j);
                if (current[1] < next[1]) {
                    for (int k = 0; k < current[1]; k++)
                        freq.add((current[0] + next[0]));
                } else
                    for (int k = 0; k < next[1]; k++)
                        freq.add((current[0] + next[0]));
            }
        }
        Collections.sort(freq);

        //Determine the most frequent height values and output the
information.
        int l = freq.size();
        int maxFreq = 1;
        ArrayList<Integer> output = new ArrayList<>();
        if(myData.size()==1) {
            System.out.println(n/2 + " " + 1);
        }else {
            for (int i = 0; i < l; i++) {
                int occur = 1;
                boolean same = true;
                while(same) {
                    if (i < l - 1 && freq.get(i).compareTo(freq.get(i +
1))==0) {
                        occur = occur + 1;
                        i++;
                    }else
                        same = false;
                }
                if(occur > maxFreq) {
                    maxFreq = occur;
                    output.clear();
                    output.add(freq.get(i));
                }else if(occur == maxFreq)
                    output.add(freq.get(i));
            }

            System.out.println("The longest length: " + maxFreq);
            System.out.println("Number of different heights is " +
output.size());
            System.out.println("If you want to see each possible height,
please type 1 otherwise type 0 " );
            if(input.nextInt()==1) {
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                System.out.println("Possible heights:" + output.toString());
            }
        }

    }

}
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