Canadian Computing Competition Senior 2015 - Editorial

Horatiu Stefan Lazu

January 12, 2016

1 CCC 2015 S1 - Zero That Out!

1.1 Explanation

The solution to this problem involves using an abstract data type called a Stack. Stacks are a FILO (First-In-Last-Out) data structure. The methods of interest in a Stack include: push(), pop(), size() and poll(). The push() method adds more numbers to the Stack, pop() removes the top-most item, size() returns the size and poll() returns the top most item but does not remove it. To solve this problem, we simply go through our Stack and push() numbers when the number is not zero, and pop() when it is equal to zero. After we are done, we go linearly through our Stack and add all the sums and return the answer.

1.2 Java Code

```
/* Horatiu Lazu */

import java.io.*;
import java.util.*;
import java.math.*;


class Main{
   public static void main (String [] args){
      new Main();
   }

   public Main(){
      try{
         BufferedReader in;
         in = new BufferedReader (new InputStreamReader (System.in));
         int dictated = Integer.parseInt(in.readLine());
         Stack a = new Stack<Integer>();
         for(int i = 0; i < dictated; i++){
            int num = Integer.parseInt(in.readLine());
            if (num == 0){
               a.pop();
            }
            else{
               a.push(num);
            }
         }
         Integer sum = 0;
         while(!a.isEmpty()){
            sum += (Integer)a.pop();
         }
         System.out.println(sum);
```

```
        }
        catch(IOException e){
           System.out.println("IO: General");
        }
     }
  }
```

2 CCC 2015 S2 - Jerseys

2.1 Explanation

This problem consists of efficiently storing the information and ensuring that we can make as many customers satisfied. We begin by declaring an array that will store for every (i+1)th jersey its appropriate size. Let's denote 1 for small, 2 for medium, and 3 for large. In the integer array, the (i)th element will represent the (i+1)th jersey size as an integer. We then go through our requests sequentially, and see if it is possible. We can choose to use a boolean array to see if the jersey was already taken, or we can choose to plurge the other array. We increment our sum variable which is our answer for every possible match. At the end, we simply output our sum variable.

2.2 Java Code

```
/* Horatiu Lazu */

import java.io.*;
import java.util.*;

public class Main{
   public static void main (String [] args){
      new Main();
   }

   public Main(){
      try{
         BufferedReader in;
         in = new BufferedReader (new InputStreamReader (System.in));
         int numJerseys = Integer.parseInt(in.readLine());
         int customers = Integer.parseInt(in.readLine());
         int [] jersey = new int[numJerseys];
         for(int qq = 0; qq < numJerseys; qq++){
            String input = in.readLine();
            if (input.equals("L")){
               jersey[qq] = 2;
            }
            if (input.equals("M")){
               jersey[qq] = 1;
            }
            if (input.equals("S")){
               jersey[qq] = 0;
            }
         }
         int sum = 0;
         boolean [] used = new boolean[numJerseys];
```

```
            for(int i = 0; i < customers; i++){
               StringTokenizer st = new StringTokenizer(in.readLine());
               String sizeS = (st.nextToken());
               int size = -1;;
               if (sizeS.equals("L")){
                  size = 2;
               }
               if (sizeS.equals("M")){
                  size = 1;
               }
               if (sizeS.equals("S")){
                  size = 0;
               }
               int num = Integer.parseInt(st.nextToken());
               if (jersey[num - 1] >= size){
                  if (used[num-1] == false){
                     sum++;
                     used[num-1] = true;
                  }
               }
            }
            System.out.println(sum);
         }
         catch(IOException e){
            System.out.println("IO: General");
         }
      }
   }
```