02 : 03 : 46
HRS MIN SEC

August Easy '21

LIVE

Aug 07, 2021, 09:30 AM IST - Aug 07, 2021, 12:30 PM IST

Binary sequences

Max. score: 100

You are given three integers Z, O, K.

Your task is to determine the number of distinct sequences of length $Z + O$ that contains exactly Z zeroes and O ones. Also, the length of longest non-decreasing subsequence in the sequence is of length $\geq K$.

Note

- Two sequences are said to be distinct if there exists at least one index where the value of element present is different in both sequences.
- A non-decreasing subsequence of a is a sequence of integers $a_{p_1}, a_{p_2}, \ldots, a_{p_k}$ where $p_1 < p_2 < .. < p_k$ and $a_{p_1} \leq a_{p_2} \leq \ldots \leq a_{p_k}$.

Input format

- The first line contains an integer T that denotes the number of test cases.
- For each test case:
  - The first line contains three space-separated integers Z, O, K.

Output format

For each test case, print the number of distinct sequences that satisfy the provided conditions.

Note: The result can be a large value, print the output in modulo $10^9 + 7$ format.

Constraints

$1 \leq T \leq 10$
$1 \leq K \leq 10^2$
$1 \leq Z, O \leq 50$

SAMPLE INPUT

```
2
2 2 3
1 4 4
```

SAMPLE OUTPUT

```
4
5
```

Explanation

For test case 1:

- Following are the valid sequences:
  - **1001** : Length of longest non-decreasing subsequence is **3**
  - **0011** : Length of longest non-decreasing subsequence is **4**
  - **0101** : Length of longest non-decreasing subsequence is **3**
  - **0110** : Length of longest non-decreasing subsequence is **3**

For test case 2:

- Following are the valid sequences:
  - **01111** : Length of longest non-decreasing subsequence is **5**
  - **10111** : Length of longest non-decreasing subsequence is **4**
  - **11011** : Length of longest non-decreasing subsequence is **4**
  - **11101** : Length of longest non-decreasing subsequence is **4**
  - **11110** : Length of longest non-decreasing subsequence is **4**

Time Limit:	1.0 sec(s) for each input file.
Memory Limit:	256 MB
Source Limit:	1024 KB
Marking Scheme:	Score is assigned if any testcase passes.
Allowed Languages:	Bash, C, C++, C++14, C++17, Clojure, C#, D, Erlang, F#, Go, Groovy, Haskell, Java, Java 8, Java 14, JavaScript(Rhino), JavaScript(Node.js), Julia, Kotlin, Lisp, Lisp (SBCL), Lua, Objective-C, OCaml, Octave, Pascal, Perl, PHP, Python, Python 3, Python 3.8, Racket, Ruby, Rust, Scala, Swift-4.1, Swift, TypeScript, Visual Basic

CODE EDITOR

Save C (gcc 5.4.0)

```
1  /*
2  // Sample code to perform I/O:
3  #include <stdio.h>
4
5  int main(){
```

```
    int num;
    scanf("%d", &num);                          // Reading input from ST
    printf("Input number is %d.\n", num);       // Writing output to STDOU
}

// Warning: Printing unwanted or ill-formatted data to output will cause
the test cases to fail
*/

// Write your code here

```

1:1 vscode

Provide custom input

COMPILE & TEST SUBMIT

Tip: You can submit any number of times you want. Your best submission is considered for computing total score.

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