SPOJ Problem Set (classical)

63. Square Brackets

Problem code: SQRBR

You are given:

- a positive integer n,
- an integer k, 1<=k<=n,
- an increasing sequence of k integers $0 < s_1 < s_2 < ... < s_k <= 2n$.

What is the number of proper bracket expressions of length 2n with opening brackets appearing in positions $s_1, s_2,...,s_k$?

Illustration

Several proper bracket expressions:

[[]][[[]][]]
[[[][]]][][[]]

An improper bracket expression:

[[[][]][]][[]]

There is exactly one proper expression of length 8 with opening brackets in positions 2, 5 and 7.

Task

Write a program which for each data set from a sequence of several data sets:

- reads integers n, k and an increasing sequence of k integers from input,
- computes the number of proper bracket expressions of length 2n with opening brackets appearing at positions $s_1, s_2,...,s_k$,
- writes the result to output.

Input

The first line of the input file contains one integer d, 1 <= d <= 10, which is the number of data sets. The data sets follow. Each data set occupies two lines of the input file. The first line contains two integers n and k separated by single space, 1 <= n <= 19, 1 <= k <= n. The second line contains an increasing sequence of k integers from the interval [1;2n] separated by single spaces.

Output

The i-th line of output should contain one integer - the number of proper bracket expressions of length 2n with opening brackets appearing at positions $s_1, s_2,...,s_k$.

Example

```
Sample input:
5
1 1
1
1 1
2
2 1
1
3 1
2
4 2
5 7


Sample output:
1
0
2
3
2
```

hide comments

2013-09-13 18:09:32 **siddhant bhatt**
dont give up!

2012-07-19 15:18:29 **npsabari**
Easy one! though not beginners DP..

2012-06-13 18:04:52 **Romal Thoppilan**
ya i also thought it was easy enough!

Last edit: 2012-08-23 17:31:55

2012-06-07 06:36:30 **Rahul Bansal**
beginners DP problem.

2012-04-10 02:05:27 **xqj**
It is a easy dynamic programming.

Last edit: 2012-04-10 02:22:24

2012-04-03 20:24:04 **Hussain Kara Fallah**
Nice DP Problem

2011-09-17 10:17:05 **pfiesteria**
It's hard for me, but finally I got AC.

2009-06-12 09:57:12 **Rajesh V**
Hint: An exercise for dynamic programming