

## 4557 Adjacent Bit Counts

For a string of  $n$  bits  $x_1, x_2, x_3, \dots, x_n$ , the *adjacent bit count* of the string ( $AdjBC(x)$ ) is given by

$$x_1 * x_2 + x_2 * x_3 + x_3 * x_4 + \dots + x_{n-1} * x_n$$

which counts the number of times a 1 bit is adjacent to another 1 bit. For example:

$$AdjBC(011101101) = 3$$

$$AdjBC(111101101) = 4$$

$$AdjBC(010101010) = 0$$

Write a program which takes as input integers  $n$  and  $k$  and returns the number of bit strings  $x$  of  $n$  bits (out of  $2^n$ ) that satisfy  $AdjBC(x) = k$ . For example, for 5 bit strings, there are 6 ways of getting  $AdjBC(x) = 2$ :

11100, 01110, 00111, 10111, 11101, 11011

### Input

The first line of input contains a single integer  $P$ , ( $1 \leq P \leq 1000$ ), which is the number of data sets that follow. Each data set is a single line that contains the data set number, followed by a space, followed by a decimal integer giving the number ( $n$ ) of bits in the bit strings, followed by a single space, followed by a decimal integer ( $k$ ) giving the desired adjacent bit count. The number of bits ( $n$ ) will not be greater than 100 and the parameters  $n$  and  $k$  will be chosen so that the result will fit in a signed 32-bit integer.

### Output

For each data set there is one line of output. It contains the data set number followed by a single space, followed by the number of  $n$ -bit strings with adjacent bit count equal to  $k$ .

### Sample Input

```
10
1 5 2
2 20 8
3 30 17
4 40 24
5 50 37
6 60 52
7 70 59
8 80 73
9 90 84
10 100 90
```

### Sample Output

```
1 6
2 63426
3 1861225
4 168212501
```

5 44874764  
6 160916  
7 22937308  
8 99167  
9 15476  
10 23076518