G • Compositions

A *composition* of an integer ***n*** is an ordered set of integers which sum to ***n***. Two *compositions* with the same elements but in different orders are considered different (this distinguishes *compositions* from *partitions*). For example, all the *compositions* of the first few integers are:

```
1: {1}
2: {1+1, 2}
3: {1+1+1, 1+2, 2+1, 3}
4: {1+1+1+1, 1+1+2, 1+2+1, 1+3, 2+1+1, 2+2, 3+1, 4}
```

Note that `1+2` and `2+1` each count as distinct compositions of `3`. As you may have suspected, there are $2^{(n-1)}$ *compositions* of ***n***.

In this problem, we set conditions on the elements of the *compositions* of ***n***. A *composition* misses a set ***S*** if no element of the composition is in the set ***S***. For example, the *compositions* of the first few integers which miss the set of even integers are:

```
1: {1}
2: {1+1}
3: {1+1+1, 3}
4: {1+1+1+1, 1+3, 3+1}
```

No odd integer can have a *composition* missing the set of odd integers and any *composition* of an even integer consisting of only even integers must be `2` times a composition of $n/2$.

For this problem you will write a program to compute the number of *compositions* of an input integer ***n*** which miss the elements of the arithmetic sequence $\{m + i*k \mid i = 0,1,\ldots\}$.

Input

The first line of input contains a single decimal integer P, $(1 \le P \le 10000)$, which is the number of data sets that follow. Each data set should be processed identically and independently.

Each data set consists of a single line of input. It contains the data set number, ***K,*** followed by the three space separated integers ***n***, ***m*** and ***k*** with ($1 <= n <= 30$) and ($0 <= m < k < 30$).

Output

For each data set there is one line of output. The single output line consists of the data set number, ***K***, followed by a single space followed by the number of *compositions* of ***n*** which miss the specified sequence.

Sample Input	Sample Output
3 1 10 0 2 2 15 1 4 3 28 3 7	1 55 2 235 3 18848806