DMOPC '19 Contest 1 P2 - Good Writing

Time limit: 1.0s **Memory limit:** 64M

A teacher once said: "Good writing is good writing is good writing."

Hence, the teacher defines $f_0 =$ "Good writing is good writing is good writing."

To make the quote more interesting the teacher defines f_n = "Good writing is good" + f_{n-1} + " writing is good" + f_{n-1} + " is good writing." for all $n \ge 1$.

For example, f_1 is

Good writing is good Good writing is good writing is good writing. writing is good writing is good writing.

Note that the quotation marks are not part of f_1 .

The teacher wants to ask q questions. Each time she wants to find the $k^{
m th}$ character of f_n .

Characters are indexed starting at 1. If f_n consists of less than k characters, output ...

Constraints

 $1 \le q \le 10$

 $0 \le n \le 30$

 $1 \le k \le 2^{31} - 1$

Input Specification

The first line contains an integer, q.

The following q lines each contains two integers, n and k in that order.

Output Specification

On the $i^{
m th}$ line, output the answer to the $i^{
m th}$ question.

Sample Input 1

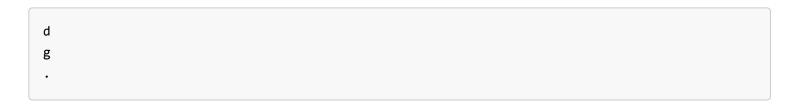
3

0 4

1 100

1 1111111

Sample Output 1



Sample Input 2

```
3
0 6
1 13
1 22
```

Sample Output 2

W G