

Problem E

Ouroboros Snake

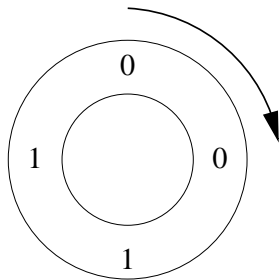
Source: ouroboros.(c|cc|pas|java)

Input: read from stdin

Ouroboros is a mythical snake from ancient Egypt. It has its tail in its mouth and continuously devours itself.

The Ouroboros numbers are binary numbers of 2^n bits that have the property of “generating” the whole set of numbers from 0 to $2^n - 1$. The generation works as follows: given an Ouroboros number, we place its 2^n bits wrapped in a circle. Then, we can take 2^n groups of n bits starting each time with the next bit in the circle. Such circles are called *Ouroboros circles* for the number n . We will work only with the smallest Ouroboros number for each n .

Example: for $n = 2$, there are only four Ouroboros numbers. These are 0011, 0110, 1100, and 1001. In this case, the smallest one is 0011. Here is the Ouroboros circle for 0011:



k	00110011...	$o(2,k)$
0	00	0
1	01	1
2	11	3
3	10	2

The table describes the function $o(n,k)$ which calculates the k -th number in the Ouroboros circle of the smallest Ouroboros number of size n . This function is what your program should compute.

Input

The input consists of several test cases. For each test case, there will be a line containing two integers n and k ($1 \leq n \leq 15$; $0 \leq k < 2^n$). The end of the input file is indicated by a line containing two zeros. Don't process that line.

Output

For each test case, output $o(n,k)$ on a line by itself.

Sample Input

```
2 0
2 1
2 2
2 3
0 0
```

Sample Output

```
0
1
3
2
```