

## Problem I. Vertex covers

Input file: *standard input*  
Output file: *standard output*  
Time limit: 2 seconds  
Memory limit: 512 mebibytes

A *vertex cover* of an undirected simple graph  $G = (V, E)$  is a subset  $S \subseteq V$  such that for every  $(u, v) \in E$  we have  $u \in S$  or  $v \in S$ . The *size* of a vertex cover  $S$  is defined as  $|S|$ .

You need to determine what is the number of simple graphs with  $n$  vertices whose smallest vertex cover has size exactly  $k$ .

Two graphs  $G_1 = (V, E_1)$  and  $G_2 = (V, E_2)$  are considered different if and only if there exist two vertices  $u, v \in V$  ( $u \neq v$ ) such that edge  $(u, v)$  belongs to exactly one of the sets  $E_1, E_2$ .

Since the answer can be very big, it suffices to print it modulo 2.

### Input

The first line of the input contains an integer  $q$  ( $1 \leq q \leq 2^8$ ) denoting the number of queries. The following  $q$  lines contain descriptions of individual queries. The  $i$ -th of them contains the description of the  $i$ -th query: two integers  $n_i$  and  $k_i$  ( $1 \leq n_i < 2^8$ ,  $0 \leq k_i < n_i$ ), denoting the number of vertices of  $G$  (i.e.,  $|V| = n_i$ ) and the desired size of the smallest vertex cover, respectively.

### Output

You should print  $q$  lines. The  $i$ -th of them should contain either 0 or 1 – the answer to the  $i$ -th query.

### Example

standard input	standard output
4	0
3 1	1
5 4	1
5 3	1
57 32	

### Partial explanation to the samples:

- In the first query  $V$  has size 3. Simple graphs with vertices set  $V$  with the smallest vertex cover of size 1 are exactly the graphs with either one or two edges. There are six of them.
- In the second query, if a graph on 5 vertices has the smallest vertex cover of size 4, it has to be a clique.