

Naya Shatranj (New Chess)

A and B are playing a very interesting variant of the ancient Indian game 'shatranj(also known as chess)' on a 'madaan'(chessboard) $n \times n$ in size.

They take turns to put game pieces called 'ghoda'(knight) so that no two 'ghodas'(knights) could threaten each other.

A 'ghoda' located in square (a,b) can threaten squares $(a+1,b+2),(a-1,b+2),(a+1,b-2),(a-1,b-2),(a+2,b-1),(a+2,b+1),(a-2,b-1),(a-2,b+1)$.

The player who can't put a new 'ghoda' during his move loses. Find out which player wins considering that both players play optimally well and A starts.

Input

The first line contains integer T ($1 \leq T \leq 10^4$) — the number of 'madaan' (boards), for which you should determine the winning player. Next T lines contain T integers n_i ($1 \leq n_i \leq 10^5$) — the sizes of the 'madaan'(chessboards).

Output

For each $n_i \times n_i$ board print on a single line "0" if A wins considering both players play optimally well. Otherwise, print "1".

Example

Input:

2

2

1

Output:

1

0