1105 – Fi Binary Number

A Fi-binary number is a number that contains only 0 and 1. It does not contain any leading 0. And also it does not contain 2 consecutive 1. The first few such number are 1, 10, 100, 101, 1000, 1001, 1010, 10000, 10001, 10010, 10100, 10101 and so on. You are given **n**. You have to calculate the **n**th Fi-Binary number.

Input

Input starts with an integer **T (≤ 10000)**, denoting the number of test cases.

Each case contains an integer **n (1 ≤ n ≤ 10^9)**.

Output

For each case, print the case number and the **n**th Fi-Binary number

Sample Input	Output for Sample Input
4 10 20 30 40	Case 1: 10010 Case 2: 101010 Case 3: 1010001 Case 4: 10001001