

Binary string of an integer is the string representation of it in binary without any leading zero. For example binary string of 5 is “101” where binary string of 13 is “1101”.

A substring is any contiguous portion of a string. For example “01” is a substring of “1011” but “00” and “111” are not.

Given  $A$ ,  $B$  and  $P$ . Find the smallest integer  $S$  such that  $P$  is a binary substring of  $S$  and  $A \leq S$  and  $S \leq B$ .  $1 \leq A, B, P \leq 10^{15}$  and  $A \leq B$ .

For example,  $A = 9$ ,  $B = 20$ ,  $P = 5$  (“101”). 10 (“1010”) is the smallest number in that range containing  $P$  as a substring.

## Input

Input starts with an integer  $T \leq 1000$ , denoting the number of test cases followed by  $T$  test cases. Each of the following  $T$  lines will contain three space separated integers  $A$ ,  $B$  and  $P$ .

## Output

For each case, print a line of the form ‘Case  $\langle x \rangle$ :  $\langle S \rangle$ ’, where  $x$  is the case number and  $S$  is the number (in decimal). If there is no valid  $S$ , then output ‘NONE’ (quotes for clarity).

## Sample Input

```
4
10 20 5
10 100 9
1 1000 7
10 20 21
```

## Sample Output

```
Case 1: 10
Case 2: 18
Case 3: 7
Case 4: NONE
```