A or B

Consider four numbers: A, B, C, and K. You must change *at most* K bits in A and B to form the numbers A' and B' satisfying the equation $A' \mid B' = C$. Here, the | symbol denotes the *bitwise OR* operation.

Given Q sets of the numbers defined above, find and print the respective values of A' and B' on new lines; if no such value exists, print -1 instead. If there are multiple solutions, make A' as small as possible; if there are still multiple solutions, make B' as small as possible.

Notes:

- A, B, and C are given in Hexadecimal (base 16), and K is given in decimal (base 10).
- If the number of bits changed in A is k_a and the number of bits changed in B is k_b, then $k_a + k_b$ must be $\leq K$.

Input Format

The first line contains an integer, Q, denoting the number of queries. The subsequent lines describe each respective query as follows:

- The first line contains a single integer denoting the value of K.
- Each of the next 3 lines contains a Hexadecimal (base 16) number describing the respective values of A, B, and C.

Constraints

- $1 \leq Q \leq 5$
- $0 \leq K \leq 5 \times 10^5$
- $0 < A, B, C < 16^{5 \times 10^4}$

Output Format

Print two lines of output for each query:

1. The first line should contain a Hexadecimal (base 16) number denoting the value of A'.
2. The second line must contain a Hexadecimal (base 16) number denoting the value of B'.

If no valid answer exists, you must instead print one line of output with the integer -1.

Note: The letters in Hexadecimal numbers must be in uppercase.

Sample Input

```
3
8
2B
9F
```

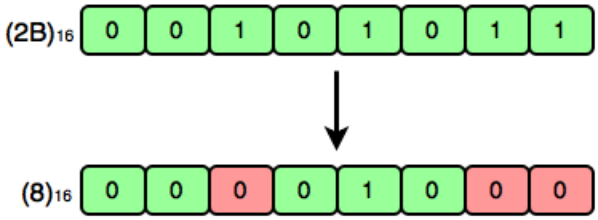
```
58
5
B9
40
5A
2
91
BE
A8
```

Sample Output

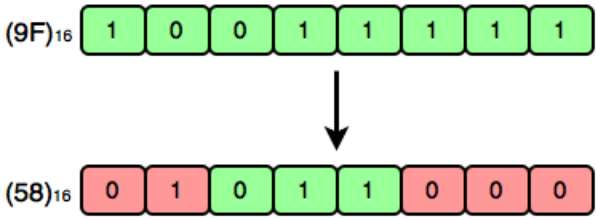
```
8
58
18
42
-1
```

Explanation

Query 0:
In this query, $K = 8$.
Change $A = (2B)_{16}$ to $A' = (8)_{16}$. 3 bits are changed.



Change B = $(9F)_{16}$ to $B' = (58)_{16}$. 5 bits are changed.



$A' \mid B' = (8)_{16} \mid (58)_{16} = (58)_{16} = C$

Query 1:
In this query, $K = 5$.
Change $A = (B9)_{16}$ to $A' = (18)_{16}$. 3 bits are changed.
Change $B = (40)_{16}$ to $B' = (42)_{16}$. Only 1 bit is changed.

$A' \mid B' = (18)_{16} \mid (42)_{16} = (5A)_{16} = C$

Query 2:
There is no valid answer, so we print -1.