Sardar Vallabhbhai National Institute of Technology
Surat-395007

Web Programming and Python (AI104)

Assignment – 5

1. Maximizing XOR

Given two integers: **L** and **R**, Find the maximal values of **A xor B** given, **L <= A <= B <= R**

Input Format:
The input contains two lines, **L** is present in the first line. **R** in the second line.
Constraints
1 <= **L <= R <=** 10^3

Output Format:
The maximal value as mentioned in the problem statement.

Sample Input #00:
1
10

Sample Output #00:
15

Sample Input #01:
10
15

Sample Output #01:
7

Explanation

In the second sample let's say **L=**10, **R**=15, then all pairs which comply to above condition are

10 xor 10 = 0
10 xor 11 = 1
10 xor 12 = 6
10 xor 13 = 7
10 xor 14 = 4
10 xor 15 = 5
11 xor 11 = 0
11 xor 12 = 7

11 xor 13 = 6
11 xor 14 = 5
11 xor 15 = 4
12 xor 12 = 0
12 xor 13 = 1
12 xor 14 = 2
12 xor 15 = 3
13 xor 13 = 0
13 xor 14 = 3
13 xor 15 = 2
14 xor 14 = 0
14 xor 15 = 1
15 xor 15 = 0
Here two pairs (**10,13)** and **(11,12)** have maximum xor value **7** and this is the answer.

2. Halloween Party

Alex is attending a Halloween party with his girlfriend Silvia. At the party, Silvia spots a giant chocolate bar. If the chocolate can be served as only 1*1 sized pieces and Alex can cut the chocolate bar exactly **K** times, what is the maximum number of chocolate pieces Alex can cut and give Silvia?

Input Format:
The first line contains an integer T, the number of test cases. T lines follow.
Each line contains an integer K

Output Format:
T lines. Each line contains an integer that denotes the maximum number of pieces can be obtained for each test case.

Constraints
$1 <= T <= 10$
$2 <= K <= 10^7$

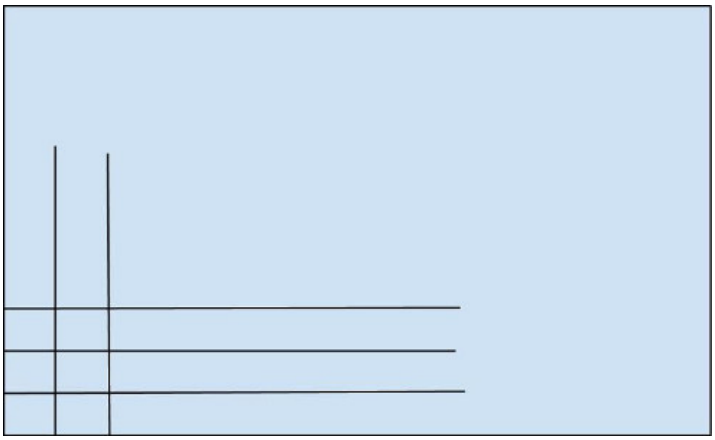
Note:
Chocolate must be served in size of 1*1 size pieces.
Alex can’t relocate any of the pieces, not can he place any piece on top of other.

Sample Input #00:
4
5 6 7 8

Sample Output #00:
6
9
12
16

Explanation:
The explanation below is for the first two test-cases. The rest of them follow a similar logic.

For the first test-case where K=5, You need 3 Horizontal and 2 Vertical cuts.



For the second test case where K=6, You need 3 Horizontal and 3 Vertical cuts.

3. Bigger is Greater

Given a word w, rearrange the letters of w to construct another word s in such a way that s is lexicographically greater than w.

Input Format:
The first line of inputs contains t, number of test cases. Each of the next t lines contains w.

Constraints:
$1 <= t <= 10^5$
$1 <= |w| <= 100$
w will contain only lower-case English letters and its length will not exceed 100.

Output Format:
For each test case, output a string lexicographically bigger than w in a separate line. In case of multiple possible answers print the lexicographically smallest one and if no answer exists, print **no answer**.

Sample Input:
3
ab
bb
hefg

Sample Output:
ba
no answer
hegf

Explanation:

Testcase 1: There exists only one string greater than ab which can be built by rearranging ab. That is ba.
Testcase 2: Not possible to rearrange bb and get a lexicographically greater string.
Testcase 3: hegt is the next string (lexicographically greater) to hefg.