Computer Programming Lab (CSCI-102)

Lab Exam

Duration: 30 mins **Total marks: 20**

Question 1:

Note: A input file named "input_1.txt" is attached with this test. Read the file as input and save the output in the required format in a separate file named "output_1.txt".

Instructions:
Submit the source code "Question_ID.c" file and "output_1.txt" file on google classroom.

Given an array *A* of *N* integers and an integer *K*.

- Choose an integer *x* such that 1≤x≤K
- Choose any index *i* such that 1≤i≤N
- Update *A[i]* = *x*

In different operations, different value of *x* and *i* can be chosen. Your task is to count minimum number of operations required such that following conditions are met:

- All elements in array *A* become pairwise distinct.
- Count of array elements with odd value is equal to count of array elements with even value.

If the above conditions cannot be met after any number of operations, print *-1*.

Note:

- Array *A* is said to have pairwise distinct elements if and only if the value of all the elements in array *A* is distinct.

Input Format:

- First line contains an integer N.
- Next line contains N space-separated integers denoting the elements of array A.
- Next line contains an integer K.

Output Format

For each test case in a new line, print the minimum number of operations required or print *-1,* if the conditions cannot be met.

Sample Input	Sample Output
4 1 4 4 1 5	2

Approach:

- Initial array *A* is *[1, 4, 4, 1]*
- Update *A[2] = 2,* choose *x = 2, i = 2*.
- Update *A[4] = 5,* choose *x = 5, i = 4.*
- Updated array *A* is *[1, 2, 4, 5]*
- Now, array *A* have all distinct elements and count of array elements with odd value is equal to count of array elements with even value.
- Therefore, minimum *2* operations are required

Constraints:

- $1 \leq T \leq 1000$
- $1 \leq N \leq 100000$
- $1 \leq A[i], K \leq 1000000000$

Question 2:

Note: A input file named "input_2.txt" is attached with this test. Read the file as input and save the output in the required format in a separate file named "output_2.txt".

Instructions: Submit the source code "Question_ID.c" file and "output_2.txt" file on google classroom.

Given *X* is an *N*-digit **even positive integer** such that *X* is divisible by 4 but not by 8.

NOTE: There should not be any leading zeros in *X.* 004 is not a valid three-digit even integer.

Input Format:

- The first line of input contains a single integer *T,* denoting the number of test cases.
- The first and only line of each test case contains a single integer *N,* denoting the number of digits in *X.*

Output Format:

- For each test case, output a single line containing *N*-digit even positive integer *X,* such that *X* is divisible by 4 but not by 8.

Constraints:

- 1≤T≤100
- 1≤N≤50

Sample Input	**Sample Output**
3 2 1 3	12 4 100