Day 1 HW Vivek Batch:

Note : Running Code of all questions discussed in class are to be mandatorily written.

Q.1. Given a N cross M matrix in which each row is sorted, find the overall median of the matrix. Assume N*M is odd.
For example,

```
Matrix=
[1, 3, 5]
[2, 6, 9]
[3, 6, 9]

A = [1, 2, 3, 3, 5, 6, 6, 9, 9]
```

Median is 5. So, we return 5.

==

Q.2. Given an array where all elements appear even number of times except one. All repeating occurrences of elements appear in pairs and these pairs are not adjacent (there cannot be more than two consecutive occurrences of any element). Find the element that appears odd number of times.
Note that input like {2, 2, 1, 2, 2, 1, 1} is valid as all repeating occurrences occur in pairs

and these pairs are not adjacent. Input like {2, 1, 2} is invalid as repeating elements don't

appear in pairs. Also, input like {1, 2, 2, 2, 2} is invalid as two pairs of 2 are adjacent.

Input like {2, 2, 2, 1} is also invalid as there are three consecutive occurrences of 2.

```
Input: arr[] = {1, 1, 2, 2, 1, 1, 2, 2, 13, 1, 1, 40, 40, 13, 13}
```

```
Output: 13
```

```
Input: arr[] = {1, 1, 2, 2, 3, 3, 4, 4, 3, 600, 600, 4, 4}
```

```
Output: 3
```

===

Q.3. Suppose a sorted array is rotated at some pivot unknown to you beforehand.

(i.e., `0 1 2 4 5 6 7` might become `4 5 6 7 0 1 2`).

You are given a target value to search. If found in the array, return its index, otherwise return `-1`.

You may assume no duplicate exists in the array.

```
Input : [4 5 6 7 0 1 2] and target = 4

Output : 0
```

===

Q.4. An Array of integers is given, both +ve and -ve. You need to find the two elements such that their sum is closest to zero.

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Q.5. Given a sorted array arr[] and a value X, find the k closest elements to X in arr[].
Examples:

```
Input: K = 4, X = 35
       arr[] = {12, 16, 22, 30, 35, 39, 42,
                45, 48, 50, 53, 55, 56}
Output: 30 39 42 45
```

Note that if the element is present in array, then it should not be in output, only the other

closest elements are required.