Median of adjacent maximum numbers

Problem Code: **MXMEDIAN**

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You are given an array **A** of size **2 * N** consisting of positive integers, where **N** is an odd number. You can construct an array B from **A** as follows, B[i] = max(**A**[2 * i - 1], **A**[2 * i]), i.e. B array contains the maximum of adjacent pairs of array **A**. Assume that we use 1-based indexing throughout the problem.

You want to maximize the median of the array B. For achieving that, you are allowed to permute the entries of **A**. Find out the maximum median of corresponding B array that you can get. Also, find out any permutation for which this maximum is achieved.

Note

Median of an array of size n, where n is odd, is the middle element of the array when it is sorted in non-decreasing order. Note that n being odd, the middle element will be unique, i.e. at index (n+1) / 2.

Input

The first line of the input contains an integer **T** denoting the number of test cases. The description of **T** test cases follows.

The first line of each test case contains an integer **N**.

The second line of each test case contains **2 * N** space separated integers denoting array **A**.

Output

For each test case, output two lines.

The first of which should contain an integer corresponding to maximum value of the median of array B that you can get.

- $1 \leq \mathbf{T} \leq 10$
- $1 \leq \mathbf{N} \leq 50000$
- $1 \leq \mathbf{A}_i \leq 2 * N$

Subtasks

- **Subtask #1** (25 points) : $1 \leq N \leq 3$
- **Subtask #2** (75 points) : original constraints

Example

```
Input:
3
1
1 2
3
1 2 3 4 5 6
3
1 3 3 3 2 2

Output:
2
1 2
5
1 3 2 5 4 6
3
1 3 3 3 2 2
```

Explanation

Example case 1. There are only two possible permutations of **A**, for both of those B will be 2. The median of B is 2.

Example case 2. For following permutation of A: 1 3 2 5 4 6, the corresponding B will be: 3 5 6, whose median is 5, which is the maximum that you can achieve.

Example case 3. For A: 1 3 3 3 2 2, the corresponding B will be: 3, 3, 2. Its median is 3, which is maximum that you can achieve.

Author:	admin2
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