6694 Toy Boxes

John has n toys $t_1, \ldots, t_n$ in three boxes b_1, b_2, b_3. Each box has at least one toy, and every toy is in a box. Each toy has a weight and let w_i denote the weight of toy t_i.

For the i-th day of the next n days John will play with toy t_i. John will bring out the box containing toy t_i, play with t_i, and at the end of the day put the box back.

Since it takes efforts to bring out a box, John wants to minimize the total weight he has to carry in order to play with all his toys. For simplicity we assume that the box has no weight. Please figure out how to place the toys into three boxes so that John can minimize the weight he has to carry in these n days.

For example, let n be 4, and w_1, w_2, w_3, w_4, be 4, 2, 2, 3, respectively. Suppose we place toy t_1 and t_3 in b_1, t_2 in b_2, and t_4 in b_3, then the total weight John will carry is $6 + 2 + 6 + 3 = 17$, as explained in the following.

1. In the first day John plays with t_1 so he has to carry box b_1, which weights 6.
2. In the second day John plays with t_2 so he has to carry box b_2, which weights 2.
3. In the third day John plays with t_3 so he has to carry box b_1, which weights 6.
4. In the fourth day John plays with t_4 so he has to carry box b_3, which weights 3.

Technical Specification

1. The number of toys n is no more than 20000.
2. The weight of a toy w_i is an integer between 1 and 1000.

Input

The first line of the input contains an integer T indicating the number of test cases. For each test case, the first line contains the number of toys n. The next line consists of the n weights of the toys.

Output

For each test case, output the minimum amount of weight John has to carry in n days, each line for one test case.

Sample Input

```
2
4
4 2 2 3
3
1 1 1
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Sample Output

```
15
3
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