Problem
Subset Sums
Time limit: 1 seconds

After solving the Subset Sum problem in $O(2^{0.49n})$ time, Little Cyan Fish wants you to solve the following task.

Little Cyan Fish has n cards. The i-th card ($1 \leq i \leq n$) has a non-negative integer a_i written on it.

For each subset $S \subseteq [n]$ of card indices, where $[n] = \{1, 2, \ldots, n\}$, he records the sum of the integers on the chosen cards, i.e., $\sum_{i \in S} a_i$. The sum for the empty subset is 0. Different subsets are recorded separately, even if their sums are equal.

After considering all 2^n subsets, he sorts these 2^n sums in non-decreasing order and denotes them by $s_0, s_1, \ldots, s_{2^n-1}$. Little Cyan Fish wants you to find the maximum difference between two consecutive sums, that is,

$$\max_{0 \leq i < 2^n - 1} (s_{i+1} - s_i).$$

Input

There are multiple test cases. The first line of the input contains a single integer T ($1 \leq T$), indicating the number of test cases.

For each test case, the first line contains a single integer n ($1 \leq n \leq 10^6$), indicating the number of cards. The second line contains n integers $a_1, a_2, \ldots, a_n$ ($0 \leq a_i \leq 10^9$), indicating the integers written on the cards.

It is guaranteed that the sum of n over all test cases does not exceed 10^6.

Output

For each test case, output a single line containing a single integer, indicating the maximum difference between two consecutive sums.

Sample Input 1

```
4
1
0
3
2 3 10
3
1 1 3
3
0 4 4
```

Sample Output 1

```
0
5
1
4
```

In the first sample test case, both subset sums are 0, so the answer is 0.

In the second sample test case, the sorted subset sums are $0, 2, 3, 5, 10, 12, 13, 15$. The maximum difference is 5, between 5 and 10.

In the third sample test case, the sorted subset sums are $0, 1, 1, 2, 3, 4, 4, 5$. The answer is 1.

In the fourth sample test case, the sorted subset sums are $0, 0, 4, 4, 4, 4, 8, 8$. The answer is 4.