Knapsack

HackerRank

Problem Statement

Given a list of n integers, $A = \{a_1, a_2, \ldots, a_n\}$, and another integer, k representing the *expected sum*. Select zero or more numbers from A such that the sum of these numbers is as near as possible, but not exceeding, to the *expected sum* (k).

Note

- Each element of A can be selected multiple times.
- If no element is selected then the sum is 0.

Input Format

The first line contains T the number of test cases.
Each test case comprises of two lines. First line contains two integers, n k, representing the length of list A and *expected sum*, respectively. Second line consists of n space separated integers, $a_1, a_2, \ldots, a_n$, representing the elements of list A.

Constraints
$1 \leq T \leq 10$
$1 \leq n \leq 2000$
$1 \leq k \leq 2000$
$1 \leq a_i \leq 2000, where\ i \in [1, n]$

Output Format

Output T lines, the answer for each test case.

Sample Input

```
2
3 12
1 6 9
5 9
3 4 4 4 8
```

Sample Output

```
12
9
```

Explanation

In the first test case, one can pick {6, 6}. In the second, we can pick {3,3,3}.