Problem E. Plants vs. Zombies

BaoBao and DreamGrid are playing the game *Plants vs. Zombies*. In the game, DreamGrid grows plants to defend his garden against BaoBao's zombies.



Plants vs. Zombies(?)
(Image from pixiv. ID: 21790160; Artist: socha)

There are n plants in DreamGrid's garden arranged in a line. From west to east, the plants are numbered from 1 to n and the i-th plant lies i meters to the east of DreamGrid's house. The i-th plant has a defense value of d_i and a growth speed of a_i. Initially, $d_i = 0$ for all $1 \le i \le n$.

DreamGrid uses a robot to water the plants. The robot is in his house initially. In one step of watering, DreamGrid will choose a direction (east or west) and the robot moves exactly 1 meter along the direction. After moving, if the i-th plant is at the robot's position, the robot will water the plant and a_i will be added to d_i. Because the water in the robot is limited, at most m steps can be done.

The defense value of the garden is defined as $\min\{d_i | 1 \le i \le n\}$. DreamGrid needs your help to maximize the garden's defense value and win the game.

Please note that:

- Each time the robot MUST move before watering a plant;
- It's OK for the robot to move more than n meters to the east away from the house, or move back into the house, or even move to the west of the house.

Input

There are multiple test cases. The first line of the input contains an integer T, indicating the number of test cases. For each test case:

The first line contains two integers n and m ($2 \le n \le 10^5$, $0 \le m \le 10^{12}$), indicating the number of plants and the maximum number of steps the robot can take.

The second line contains n integers $a_1, a_2, ..., a_n$ ($1 \le a_i \le 10^5$), where a_i indicates the growth speed of the i-th plant.

It's guaranteed that the sum of n in all test cases will not exceed 10^6.

Output

For each test case output one line containing one integer, indicating the maximum defense value of the garden DreamGrid can get.

Example

standard input	standard output
2 4 8 3 2 6 6 3 9 10 10 1	6 4

Note

In the explanation below, 'E' indicates that the robot moves exactly 1 meter to the east from his current position, and 'W' indicates that the robot moves exactly 1 meter to the west from his current position.

For the first test case, a candidate direction sequence is {E, E, W, E, E, W, E, E}, so that we have $d = \{6, 6, 12, 6\}$ after the watering.

For the second test case, a candidate direction sequence is {E, E, E, E, W, E, W, E, W}, so that we have $d = \{10, 10, 4\}$ after the watering.