Problem C. Magic Crystal

Time limit   1000 ms
Memory limit   256MB

Problem Description

On their journey to defeat the Demon King, the hero Himmel and his companion Frieren passed through a mysterious town bathed in a strange red light. Upon closer inspection, they discovered that the light came from a network of peculiar red stones embedded in the ground. These stones crisscrossed the town, making it resemble a giant chessboard.

The town mayor warmly welcomed the heroes and made a request to Himmel. The town of Redstone was once home to a great sorcerer who had set up a simple protective magic. This magic could be activated by aligning K crystal statues in a straight line **in order**, ensuring that each statue, with its x_i magical interfaces, touches a red stone path. Once aligned, a protective barrier would rise along this line. Since the red stones only form straight and horizontal lines, correctly placing the crystal statues in all four directions would create a rectangular barrier, easily covering the town.

Unfortunately, the crystal statues on the eastern side had been displaced due to an accident. The mayor asked Himmel to help re-establish the barrier in a way that maximizes the protected area. To do so, they must push the eastern edge of the barrier as far from the town center as possible. Fortunately, the village elder provided a complete map of the red stone paths, indicating that there are N straight lines in the horizontal direction, each extending h_i units from the town center. Since the barrier is infinitely long, you only need to focus on extending it in this direction.

Input format

The first line contains two integers, N and K, where N represents the number of red stone paths, and K represents the number of crystal statues. ($1 \leq N \leq 2 \times 10^5$; $1 \leq K \leq 5000$)

The second line contains N positive integers, h_i representing the maximum distance each red stone path can extend from the town center. ($1 \leq h_i \leq 10^9$)

The third line contains K positive integers, x_i representing the number of magic interfaces each crystal statue need. ($\sum x_i \leq N$)

Output format

Output a single integer, representing the maximum distance the eastern edge of the barrier can be from the town center. If it's impossible to establish the barrier, output 0.

Subtask score

Subtask	Score	Additional Constraints
1	40	$K = 1$
2	60	No constraints

Sample

Sample Input 1

```
4 1
3 7 5 4
3
```

Sample Output 1

```
4
```

- Sample Input 2
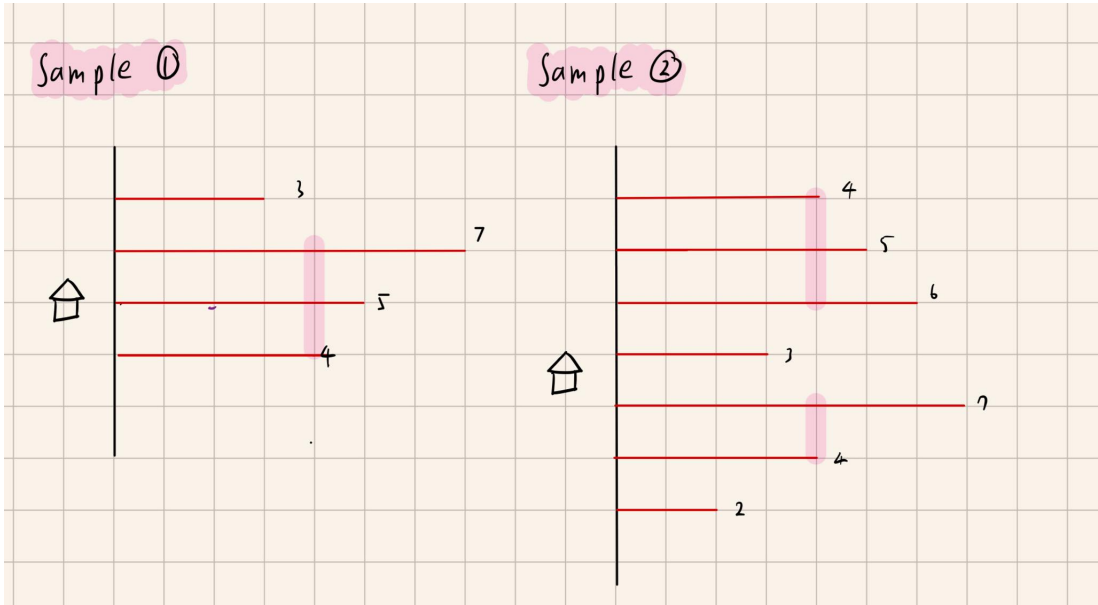
```
7 2
4 5 6 3 7 4 2
3 2
```

Sample Output 2

```
4
```

Notes

Fig. 1

This figure explains the examples below.