

# Greed

**Input File:** *standard input*  
**Output File:** *standard output*

Happy birthday! It is time to cut your cake! Including you, there are  $K + 1$  hungry people who are eager for some of your  $R$  row by  $C$  column rectangular cake. To ensure fairness, there are some rules about how you may cut your cake.

- You must make  $K$  cuts, in order to split the cake into  $K + 1$  pieces.
- Every cut must be made parallel to the sides of the rectangle.
- Every cut must begin on either the left or bottom side of the cake, and must continue until it hits either the opposite side of the cake or an existing cut.
- There are  $H$  allowed locations for horizontal cuts and  $V$  locations allowed for vertical cuts.
- Once all cuts have been made, you will receive the largest piece of cake.

You love cake, but do not wish to be seen to be greedy. In order to avoid this fate, you must make the area of the largest piece of cake as small as possible.

## Input

- The first line of input contains five integers  $R C K H V$ .
- The following  $H$  lines contain one integer each, the  $i$ -th of which being  $y_i$ . This indicates a horizontal cut can be made  $y_i$  units up from the bottom side of the cake. These will be distinct and strictly increasing.
- The following  $V$  lines contain one integer each, the  $i$ -th of which being  $x_i$ . This indicates a vertical cut can be made  $x_i$  units to the right of the left side of the cake. These will be distinct and strictly increasing.

## Output

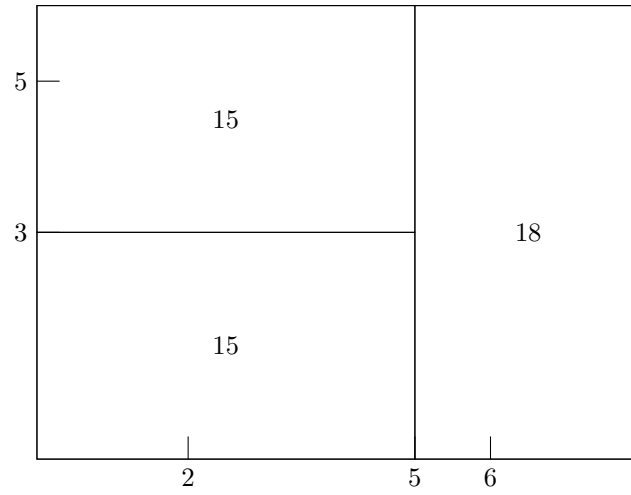
Output must consist of a single integer representing the area of the smallest possible largest slice of cake.

### Sample Input

```
6 8 2 2 3
3
5
2
5
6
```

### Sample Output

```
18
```

**Explanation**

In this example, it is possible for us to create vertical cuts at 2, 5, and 6, as well as horizontal cuts at 3 and 5.

By first cutting the cake vertically at position 5, and then horizontally at position 3, we can produce two slices of area 15 and once slice of area 18. This is the smallest we can make the largest slice, and so we output 18.

**Subtasks & Constraints**

For all subtasks,  $1 \leq K \leq H + V$ ,  $0 \leq H, V \leq 1500$ ,  $2 \leq R, C$ ,  $4 \leq RC \leq 2^{30}$ ,  $1 \leq x_i < C$  and  $1 \leq y_i < R$ .

- For Subtask 1 (10 points),  $H, V \leq 10$ .
- For Subtask 2 (15 points),  $K = H + V \leq 40$ .
- For Subtask 3 (15 points),  $H, V \leq 40$ .
- For Subtask 4 (20 points),  $H, V \leq 100$ .
- For Subtask 5 (20 points),  $K \leq 100$ ,  $H, V \leq 300$ .
- For Subtask 6 (20 points), no additional constraints.