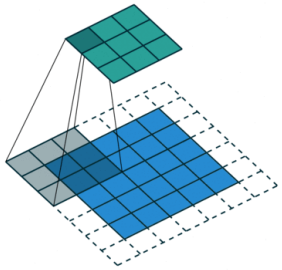
Problem D: Image Filtering

Time limit: 3s; Memory limit: 512 MB



In computer vision, image filtering a technique used to change the appearance of an image by altering the colors of the pixels. Hung is a student of data science and artificial intelligence course of DUT. He is very interesting with following filtering method:

Given an image **A** of size $h \times w$. Each pixel of **A** has a brightness level of $a_{i,j}$ ($1 \le i \le h$ and $1 \le j \le w$). Hung uses a filter **L** which is a matrix of intergers $l_{x,y}$ of size X × Y ($1 \le x \le X$, $1 \le y \le Y$) and X, Y are odd numbers. The output of the method is a image **B** of the same size as **A** and whose pixels' brightness level b_{ij} are calculated by the following formula:

$$b_{ij} = \sum_{x=1}^{X} \sum_{y=1}^{Y} l_{x,y} \times a_{i+x-\left\lceil \frac{X+1}{2} \right\rceil, j+y-\left\lceil \frac{Y+1}{2} \right\rceil}$$

Note, if i or j do not satisfy the condition $1 \le i \le h$ and $1 \le j \le w$ then $a_{i,j}$ is considered equal to 0. $\lceil * \rceil$ represents the formula to round up. Please help Hung to implement the program using the above method.

Input

- The first line contains 4 natural numbers h, w, X and Y ($1 \le h \times w \le 5 \times 10^5$, $1 \le X \le h$, $1 \le Y \le w$ and X, Y are odd numbers).
- Next h lines are brightness level $a_{i,j}$ of image **A** ($0 \le a_{i,j} \le 5 \times 10^5$).
- Next X lines are matrix of intergers $l_{x,y}$ of filter **L** ($0 \le l_{i,j} \le 5 \times 10^5$).

Output

- Print brightness level $b_{i,j}$ of image **B**.

Sample

Input	Output
3 3 3 3 1 2 3 4 5 6 7 8 9 1 1 1 1 1 1 1 1 1	12 21 16 27 45 33 24 39 28
3 3 1 3 1 2 3 4 5 6 7 8 9 1 2 1	4 8 8 13 20 17 22 32 26