Problem D: Dilation

Sabbir is a student of fourth year in CSE department. His course teacher recently gave him an assignment that is discussed below. But he is a little bit weak in programming. So, he needs your help to solve the problem.

Morphological image processing is a collection of non-linear operations related to the shape or morphology of features in an image. One of the most basic morphological operations is *dilation*. *Dilation* adds pixels to the boundaries of objects in an image. The number of pixels added to the objects in an image depends on the size and shape of the *structuring element* used to process the image. A *structuring element* is a shape mask used in the basic morphological operations. They can be of any shape and size that is digitally representable, and each has an origin. The matrix dimensions specify the *size* of the structuring element and the pattern of ones and zeros specifies the *shape* of the structuring element. In this task the *size* of the structuring element is square i.e. 2×2, 3×3, or 4×4 etc. and can be of any shape.

The morphological functions use the following code to get the coordinates of the origin of structuring elements of any size and dimension.

```
origin = floor(size(structuring_element)/2)
```

If structuring element matrix is `[0 1 0; 1 1 1; 0 1 0]`

Then, `size(structuring_element)= 3×3`
So, `origin = (1,1) [i.e. see the following figure]`

Dilate (B,S) takes binary image B, places the origin of the structuring element S over each 1-pixel, and ORs the structuring element S into the output image at the corresponding position.

Binary image	Structuring Element		Output Binary image
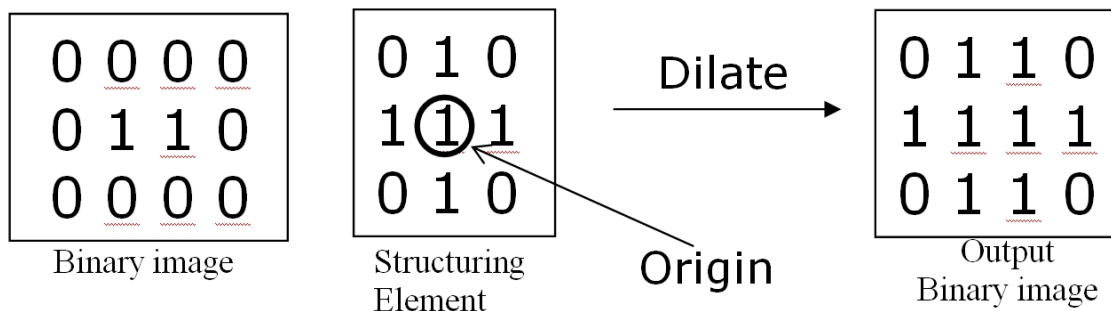
Input
First line of the input file is an integer **T (T < 25)** which denotes how many sets of inputs are there. Each test case starts with the dimensions of the binary image **m×n** where **m (2 ≤ m ≤ 100)** is the number of rows and **n (2 ≤ n ≤ 100)** is the number of columns. Followed by the binary image which contains only **0** or **1**. Then followed by the dimensions of the *structuring element* **q×r** where **q (1 ≤ q ≤ 10)** is the number of rows and **r (1 ≤ r ≤ 10)** is the number of columns and then followed by the *structuring element. Size of structuring element* will be less than or equal to binary image **(q ≤ n, r ≤ m)**. **In input binary image border lines will not contain any 1's**.

Output

For each test case print the binary image after dilation process.

N.B: In output there will be no blank space (" ") after the end of a line.

Sample Input	Output for Sample Input
2 3 4 0 0 0 0 0 1 1 0 0 0 0 0 3 3 0 1 0 1 1 1 0 1 0 4 4 0 0 0 0 0 1 0 0 0 0 1 0 0 0 0 0 3 3 1 1 1 1 1 1 1 1 1	Case 1: 0 1 1 0 1 1 1 1 0 1 1 0 Case 2: 1 1 1 0 1 1 1 1 1 1 1 1 0 1 1 1

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Alternate Solution : Tanveer Ahsan