

Dilation

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|--------------------|----------------|
| Problem Code | hw05b_dilation |
| Running Time Limit | 1 sec |
| Memory Limit | 16 mb |

Objective

- Be able to find dilation in binary images.

Introduction

A binary image is a 2D grid of size $N \times M$ cells such that a value in each cell is either 0 or 1. We define a **distance** of two cells (x_1, y_1) and (x_2, y_2) as $(|x_1 - x_2| + |y_1 - y_2|)$. A **closest-one-distance** of any cell is the smallest distance from that cell to the other cell with value 1.

A **distance K dilation** of a binary image is a modification of that binary image by converting every value 0 cell that has closest-one-distance not more than K into value 1 cell. The following example shows dilations of a binary image.

| Original Image | | | | | Distance 1 dilation | | | | | Distance 2 dilation | | | | |
|----------------|---|---|---|---|---------------------|---|---|---|---|---------------------|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |

Task

Given a binary image and a distance K , your task is to compute distance K dilation of that image.

Input

The first line contains three numbers N, M and K ($1 \leq M, N, K \leq 500$) describing the width and the height of the image and the value K for dilation. This is followed by M lines; each contains N number of value 1 and 0 that describes each line in the image.

Output

There must be M lines in the output; each has N numbers describes the distance K dilation of the given image.

Example

Ex1

| Input | Output |
|-----------|-----------|
| 5 4 2 | 1 1 1 1 1 |
| 0 1 0 0 1 | 1 1 1 1 1 |
| 0 0 0 0 0 | 0 1 0 0 1 |
| 0 0 0 0 0 | 0 0 0 0 0 |
| 0 0 0 0 0 | 0 0 0 0 0 |