Hi there! Thank you for taking the time to complete a code challenge with dott.
Good luck and we hope you will find it interesting!

Guidelines:

- Please solve these tasks in TypeScript and make sure to complete the challenge in 48 hours.
- Please commit your code to a Git repo we can access.

Task

There is given a rectangular bitmap of size n*m. Each pixel of the bitmap is either white or black, but at least one is white. The pixel in i-th line and j-th column is called the pixel (i,j). The distance between two pixels p1=(i1,j1) and p2=(i2,j2) is defined as d(p1,p2)=|i1-i2|+|j1-j2|.
Write a program which:

- reads the description of the bitmap from the standard input;
- for each pixel, computes the distance to the nearest white;
- writes the results to the standard output.

Input

The number of test cases t (1≤t≤1000) is in the first line of input, then t test cases follow separated by an empty line. In the first line of each test case there is a pair of integer numbers n, m separated by a single space, 1<=n <=182, 1<=m<=182. In each of the following n lines of the test case exactly one zero-one word of length m, the description of one line of the bitmap, is written. On the j-th position in the line (i+1), 1 <= i <= n, 1 <= j <= m, is '1' if, and only if the pixel (i,j) is white.

Output

In the i-th line for each test case, 1<=i<=n, there should be written m integers f(i,1),...,f(i,m) separated by single spaces, where f(i,j) is the distance from the pixel (i,j) to the nearest white pixel. Example:

Input:
1
3 4
0001
0011
0110

Output

3 2 1 0
2 1 0 0
1 0 0 1