Bitmap

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 $\mathbf{p_1}=(i_1,j_1)$ and $\mathbf{p_2}=(i_2,j_2)$ is defined as:

$$d(\mathbf{p_1},\mathbf{p_2})=|i_1-i_2|+|j_1-j_2|.$$

Task

Write a program which:

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

Input

The number of test cases t 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

Sample input:

```
1
3 4
0001
0011
0110
```

Sample output:

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