Chapter 7

After Mid: Refreshments

7.1 Task 1

In Microsoft Excel the rows are numbered using integers and columns are numbered using English alphabets. For example, the 1^{st} column is 'A', the 5^{th} column is 'E', the 15^{th} column is 'O'.

When the 27^{th} column in reached there are no English letters remaining for the column to be numbered by. Now, the columns are numbered using 2 English letters together. So, the 27^{th} column is AA, the 28^{th} is AB, the 29^{th} is AC. When all such 2 letter combinations are used, the columns are numbered using 3 English letters. This process continues to give numbers to infinitely many columns [Or the user gets tired of using so many columns!!].

Given an integer n, your task is to find the number of the n^{th} column.

Input:
57
475255

Output:
BE
AAAAA

7.2 Task 2

The slogan of the recent fresher's reception of the CSE department made some of the students curious about computer displays and how images are represented in computers. The students found out that when any picture is stored in a computer the picture is divided into an $n \times n$ grid where n is a positive integer. Each cell of the grid contains an integer value which represents a specific shade of color. What they found even more interesting is that they could now easily implement some of the filters that they use in Snapchat, Facebook, and Instagram. Your task is to implement one of these filters which makes an image look smoother.

You already know an image will be represented by an $n \times n$ integer array where n is an integer. A neighbor distance, d is also specified where d is an integer. For any given index (i, j) in the array, all the indices that are within distance d are considered to be the neighbors of index (i,

5 (0,0)	7 (0,1)	5 (0,2)	4 (0,3)	0 (0,4)
8 (1,0)	1 (1,1)	15 (1,2)	2 (1,3)	11 (1,4)
3 (2,0)	4 (2,1)	2 (2,2)	13 (2,3)	4 (2,4)
9 (3,0)	12 (3,1)	7 (3,2)	8 (3,3)	6 (3,4)
11 (4,0)	3 (4,1)	8 (4,2)	15 (4,3)	12 (4,4)

j). For example, in the given figure, if $d = 1$ then the neighbors of the index (1,1) are (0, 0), (0, 1), (0, 2), (1,0), (1, 2), (2, 0), (2, 1), (2, 2). For $d = 2$, all the indices of the array would be the neighbor of (2, 2).

Now to make the image smooth, follow these steps:

1. Take the first index (0, 0)
2. Find the average of the values stored in the neighbor indices and also the current index.
3. Store this value in the current index location. If the index of any neighbor is out of bound then ignore that neighbor. For example, the value to be stored in index (0, 0) for $d = 1$ will be $\frac{7+8+1}{3}$.
4. Repeat steps 2 and 3 for every index in the array.

7.2.1 Input

The first line of input will be the integers n and d. The following lines will be the $n \times n$ array.

7.2.2 Output

The output will be the $n \times n$ after applying the filter.

7.2.3 Example

Input:
3 1
1 2 3
4 5 6
7 8 9

Output:
3 3 4
4 5 5
6 6 7