Given a Matrix of size **M x N**, rotate all the elements of each ring according to the given instructions.

**Function Description**

If the top left element of a ring in the matrix is **Prime**, rotate all the elements in **Clockwise** direction.

If the top left element of a ring in the matrix is **Non-Prime**, rotate all the elements in **Anti-Clockwise** direction.

If any of the input is not under the constraints then **STDOUT** should be “**INVALID INPUT**”.

**Input Format**

The first and second line of the input denotes the total number of respective rows and columns in the Matrix. Subsequent lines will contain all the elements in the row.

3

4

1 2 3 4

5 6 7 8

9 10 11 12

**Constraints**

1 <= **M** <= 10^{7} , 1 <= **N** <= 10^{7} , 1 <= matrix[**M**][**N**] <= 10^{5}

**Output Format**

2 3 4 8

1 6 7 12

5 9 10 11

**Sample Input**

4

4

1 2 3 4

5 6 7 8

9 10 11 12

13 14 15 16

**Sample Output**

2 3 4 8

1 10 7 12

5 11 6 16

9 13 14 15

**Explanation**

The top-left number of the first ring of the matrix is **1**, as **1** is **not a prime** number the matrix was rotated in **Anti-Clockwise** direction. While the top-left number of the second ring of the matrix is **7**, as **7** is a **prime** number the matrix was rotated in **Clockwise** direction.