Additional Part. SpiralMatrix

Design a program and output the matrix below:

Input:

```
3 4
```

Output:

```
1 2 3 4
10 11 12 5
9 8 7 6
```

Input:

```
5 7
```

Output:

```
1 2 3 4 5 6 7
20 21 22 23 24 25 8
19 32 33 34 35 26 9
18 31 30 29 28 27 10
17 16 15 14 13 12 11
```

1. Build Wall

To avoid array out-of-bounds problems, we build a wall around it. For example the row and the column of matrix are 3 and 4 respectively. Then we create a matrix as:

```
int[][] matrix = new int[row+2][col+2]
```

Then try to fill the matrix below:

```
-1 -1 -1 -1 -1 -1
-1 0 0 0 0 -1
-1 0 0 0 0 -1
-1 0 0 0 0 -1
-1 -1 -1 -1 -1 -1
```

2. Build Direction:

The directions in this question are in the order like: right - down - left - up.

Create a structure representing the direction. The structure can be:

(1) Two-d array:

```
int[][] directions = {{0, 1}, {1, 0}, {0, -1}, {-1, 0}};
```

(2) Class:

```
class Direction {
    int row;
    int col;

    public Direction(int row, int col) {
        this.row = row;
        this.col = col;
    }

    public static void main(String[] args) {
        Direction[] directions = new Direction[4];
        directions[0] = new Direction(0, 1);
    }
}
```

(3) Enum

```
enum Direction{
  RIGHT(0,1), DOWN(1,0), LEFT(0,-1),UP(-1,0);
  int row;
  int col;
  Direction(int row, int col) {
    this.row = row;
    this.col = col;
  }
}
```

3. Go

If the original row = 2, col = 2, then go right, the new value of row and column are:

```
int newRow = row + 0;//2
int newCol = col + 1;//3
```

(1) Two-d array:

go right:

```
int newRow = row + directions[0][0];
int newCol = col + directions[0][1];
```

(2) Class:

Go right:

```
int newRow = row + directions[0].row;
int newCol = col + directions[0].col;
```

(3) Enum

Go right:

```
int newRow = row + Direction.RIGHT.row;
int newCol = col + Direction.RIGHT.col;
```

4. Change direction

If the next position in matrix is not zero, change direction.

```
if(matrix[newRow][newCol]==0){
    //todo: visit the next position and update the row and col
}else{
    //todo:change direction
}
```