# 顺时针打印矩阵

## 题目

输入一个矩阵，按照从外向里以顺时针的顺序依次打印出每一个数字，例如，如果输入如下4 X 4矩阵： 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 则依次打印出数字1,2,3,4,8,12,16,15,14,13,9,5,6,7,11,10.

## 解题思路

1. 通过4个指针，表示可打印区域，并对区域进行收缩
2. 非 n\*n 的矩阵，对于剩余非 4 边遍历的元素，要考虑边界

public ArrayList<Integer> printMatrix(int[][] matrix) {
 ArrayList<Integer> res = new ArrayList<>();

 if (matrix.length == 0) {
 return res;
 }

 if (matrix.length == 1) {
 for (int i : matrix[0]) {
 res.add(i);
 }

 return res;
 }

 int top = 0, bottom = matrix.length - 1, left = 0, right = matrix[0].length - 1;

 for (; left <= right && top <= bottom; ) {
 if (top == bottom) {
 for (int i = left; i <= right; i++) {
 res.add(matrix[top][i]);
 }
 break;
 }

 if (left == right) {
 for (int i = top; i <= bottom; i++) {
 res.add(matrix[i][left]);
 }

 break;
 }

 for (int p = left; p <= right; p++) {
 res.add(matrix[top][p]);
 }
 top++;

 for (int p = top; p <= bottom; p++) {
 res.add(matrix[p][right]);
 }
 right--;

 for (int p = right; p >= left; p--) {
 res.add(matrix[bottom][p]);
 }
 bottom--;

 for (int p = bottom; p >= top; p--) {
 res.add(matrix[p][left]);
 }
 left++;
 }
 return res;
}