# 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;  
}