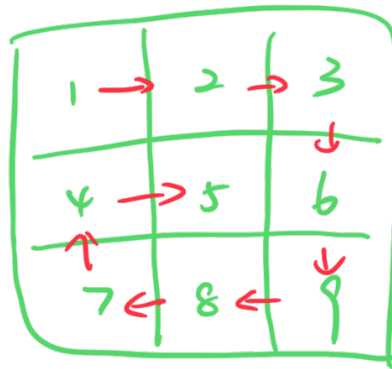


## 54. Spiral Matrix

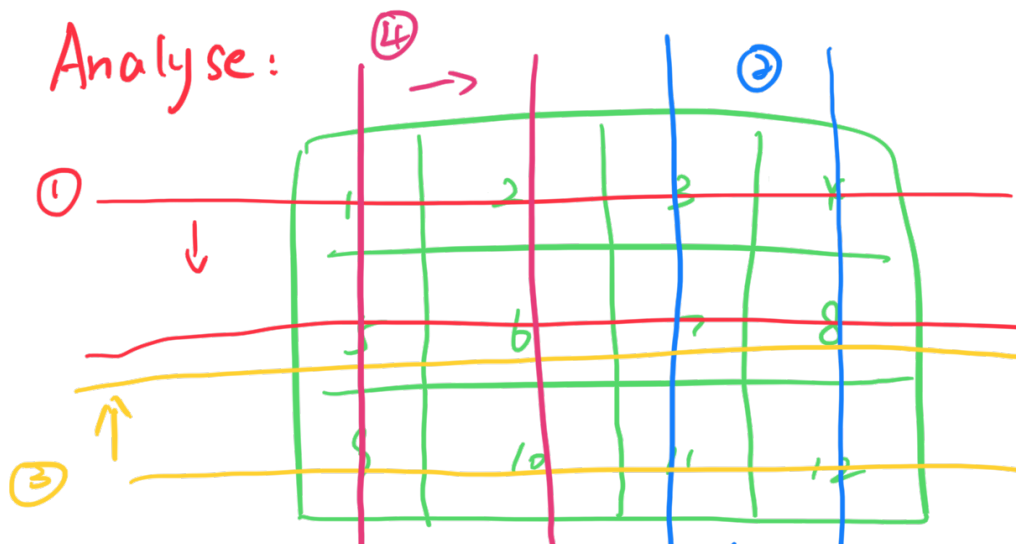
- $m \times n$  matrix
- spiral order

Example:



Seems like no better algorithm.

We can define 4 directions for helping us to loop this matrix.



① Now RowTop from 0 to 1

res = [ 1, 2, 3, 4 ]

② Now ColRight from 3 to 2

res = [ 1, 2, 3, 4  
8, 12 ]

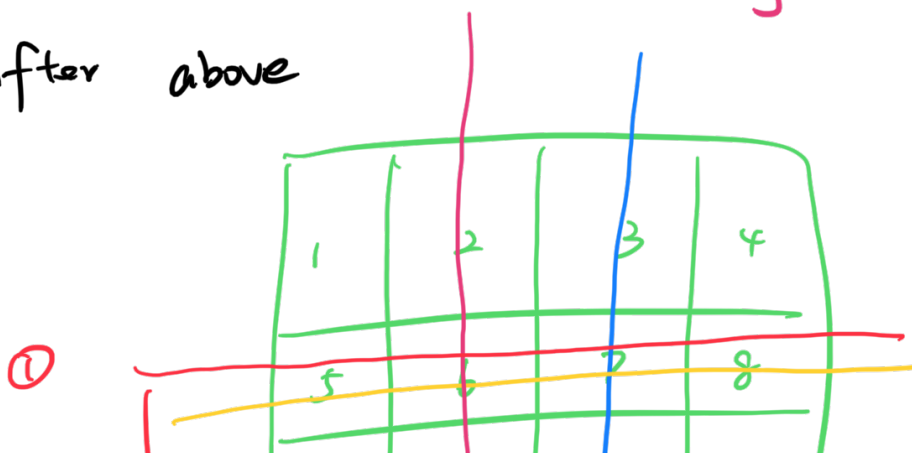
③ Now RowBott from 2 to 1

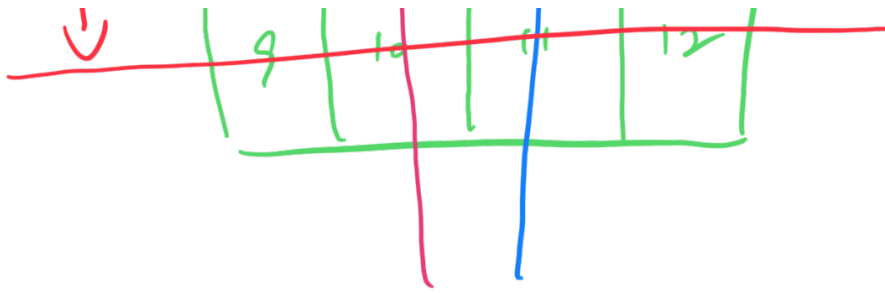
res = [ 1, 2, 3, 4  
8, 12  
11, 10, 9 ]

④ Now ColLeft from 0 to 1

res = [ 1, 2, 3, 4  
8, 12  
11, 10, 9  
5 ]

After above





Row Top = Row Bott = 1

col Left = 1 , col Right = 2

Repeat

① Row Top = 2 > Row Bott  
stop

pseudo code :

# get the size of matrix

$m = \text{len}(\text{matrix})$

$n = \text{len}(\text{matrix}[0])$

# Now , we have 4 directions ,

Row Top = 0

Row Bott =  $m - 1$

col Left = 0

col Right =  $n - 1$

# initialize

ans = []

# looping :

while (true) :

# first row

① for ( i = colLeft, i <= colRight, i++)  
ans.append (matrix[i][j])

if ( RowTop++ > RowBott )  
break

② for ( i = RowTop, i <= RowBott, i++)  
ans.append ( ... )

if ( colRight-- < colLeft )  
break

③

- - -

④

- - -

Above 4 steps corresponding to  
steps in Analyse .

Return ans .