

## 48 - Rotate Image

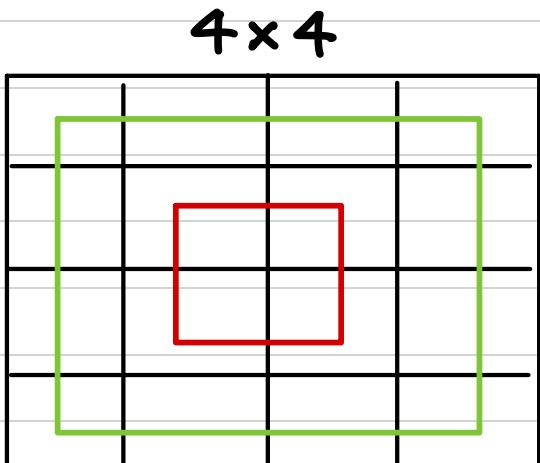
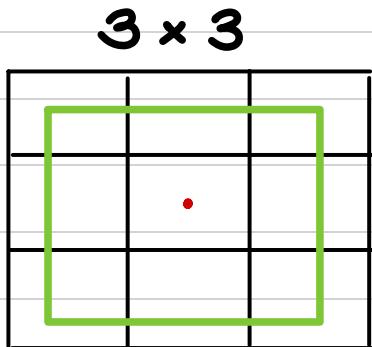
1	2	3
4	5	6
7	8	9

Rotate  $90^\circ$  CW

7	4	1
8	5	2
9	6	3

Must be done in-place.

Approach 1 : Go layer-wise, from out to in, and use an array to store and rotate the elements of that layer.  $\times$



Move each layer like a conveyor belt,  
 $\# \text{shifts} = n-1$ , where layer is outer layer  
of  $n \times n$  square.

## Approach 2: Transpose + Horizontal Reflection ✓

After transpose, we get :

TOP → LEFT

BOTTOM → RIGHT

LEFT → TOP

RIGHT → BOTTOM

But we want :

TOP → RIGHT

BOTTOM → LEFT

LEFT → TOP

RIGHT → BOTTOM

So, we need only swap LEFT and RIGHT  
i.e., horizontal reflection.