

(13)

a) invert(N, A)

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for i in range N:
    for j in range A[i].length()
        if A[i][j] == 0
            A[i][j] = 1
        else:
            A[i][j] = 0
        endif
    endfor
endfor
end invert()
    
```

b) i) ~~270°~~ 270°

ii) k mod 4 cancels out unnecessary rotations e.g. $k = 5 \% 4 = 1$
 $n = 1$
 $5 \cdot 90^\circ \text{ rotates} = 1 \cdot 90^\circ \text{ rotation}$

c) rotate(N, A) length = c row = r
 newArr[] = b

for i in range 0 to N-1:

for j in range 0 to N-1:

~~newArr[N-1-j][N-1-i] = A[i][j]~~ $b[i][j] = A[N-j-1][i]$
~~N-1-j~~ ~~N-1-i~~

end for:

end for

return newArr b

d) rotate(N, A)

loop i to N-1

loop j to N-1

// Transpose
 // flip cols/rows

c = A[i][j]

A[i][j] = A[j][i]

A[j][i] = c

end loop

end loop

*

// reversing rows

* loop i to N-1

loop j to N-1

[N-1-i]

c = A[i][j]

A[i][j] = A[j][N-1-i]

A[j][N-1-i] = c

end loop

end loop

return A.