

1. $\forall n^x \leq c \cdot n^4, n \geq n_0$ when $c=1, n_0=0 \therefore n^x \in O(n^4)$

$n^4 \leq c \cdot n^x, n \geq n_0$ when $c = n^{4-x}$, $n_0=0$ $\therefore n^4$ is not $O(n^x)$
_{not a constant} #

2. [3]

[3, 8]

[3, 8, 9]

[5, 3, 8, 9]

[3, 8, 9]

[3, 8]

output: 3

[3, 8, 7]

[8, 7]

output: 7

[8]

3. for i from 0 to m+1:

row-max = 0

for j from 0 to n+1:

if $A[i][j] > A[i][\text{row-max}]$ then row-max = j

correct = 1

for ii from 0 to n+1:

if $A[ii][j] > A[i][j]$ then correct = 0 and break

if correct then return $A[i][j]$.

~~time complexity~~ = $O(m \times n^2)$

4.

b := 1, list := [], ...

while b ≤ N:

list.append('0:b', format(b))

b += 1

return list

time complexity = $O(N)$

space complexity = $O(N)$