Asymptotic Space Complexity of IntGrid 2d

2d Rectangular grid. $h \times w$

Δh causes space to increase by $\Delta h \times w$

Δw causes space to increase by $\Delta w \times h$

2d space maps directly to memory space, with each position in our grid taking the amount of space of a char

(I'm neglecting the array's organizational memory)

$$\Delta S(\Delta h, \Delta w) = \Delta h \times w + \Delta w \times h$$

$$S = (h + \Delta h)(w + \Delta w)$$

if only changing 1 var grows linearly @ lower bound

$$\Omega(f(\Delta h) = \Delta h \times w) \quad \boxed{\Omega(n)}$$

if both var change, you find an upper bound that is polynomial increasing both variables on a square matrix $w = h$ will result in the max upper bound. Two increasing vars will multiply w/ eachother.

for growing square $\Delta h = \Delta w$

$$O(f(\Delta h, \Delta w) = \Delta h \times \Delta w = \Delta h^2) \quad \boxed{O(n^2)}$$

no Θ in this case

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