Strassen's Matrix Multiplication

Matrix Multiplication → $O(n^3)$

↳ Three for loops

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \times \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix} = \begin{bmatrix} 1*5+2*7 & 1*6+2*8 \\ 3*5+4*7 & 3*6+4*8 \end{bmatrix}$$

⇓

Divide & conquer approach

⇓

Recursion

⇓

Recurrence Relation

⇓

$$T(n) = 7T\left(\frac{n}{2}\right) + n^2$$

$$T(n) = O\left(n^{\log_2 7}\right)$$

$$T(n) = O\left(n^{2.81\ldots}\right)$$

Practice Question

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