Excercises from Introduction to Algorithms 4th Edition

Bradlee Harrison

October 6 2023

1 Strassen's Algorithm

Strassen's algorithm is an efficent algorithm for matrix multiplication. Rather than $O(n^3)$ runtime, it is capable of $O(n^2.81)$ runtime.

Problem 4.2-1

Use Strassen's algorithm to compute the matrix product

$$\begin{pmatrix} 1 & 3 \\ 7 & 5 \end{pmatrix} \cdot \begin{pmatrix} 6 & 8 \\ 4 & 2 \end{pmatrix}$$

1. Partition the input matrices A and B and output matrix C into $n/2 \times n/2$

$$A_{11} = 1, A_{12} = 3, A_{21} = 7, A_{22} = 5$$
$$B_{11} = 6, B_{12} = 8, B_{21} = 4, B_{22} = 4$$