CE100 Algorithms and Programming II

RAM / Matrix Multiplication

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0.1 CE100 Algorithms and Programming II

0.2 Week-3 (Matrix Multiplication/ Quick Sort)

0.2.0.1 Spring Semester, 2021-2022

Download DOC[1], SLIDE[2], PPTX[3]

0.3 Solving Recurrences

0.4 Outline

- Matrix Multiplication
  - Traditional
  - Recursive
  - Strassen

Out-line

Out-line

[1] ce100-week-3-matrix.md_doc.pdf
[2] ce100-week-3-matrix.md_slide.pdf
[3] ce100-week-3-matrix.md_slide.pptx

Outline

- Quicksort Analysis
- Randomized Quicksort
- Randomized Selection
- Recursive
- Medians

0.5 Matrix Multiplication

- **Input:** $A = [a_{ij}], B = [b_{ij}]$
- **Output:** $C = [c_{ij}] = A \cdot B \implies i, j = 1, 2, 3, \ldots, n$

$$\begin{bmatrix} c_{11} & c_{12} & \ldots & c_{1n} \\ c_{21} & c_{22} & \ldots & c_{2n} \\ \vdots & \vdots & \vdots & \ddots \\ c_{n1} & c_{n2} & \ldots & c_{nn} \end{bmatrix} = \begin{bmatrix} a_{11} & a_{12} & \ldots & a_{1n} \\ a_{21} & a_{22} & \ldots & a_{2n} \\ \vdots & \vdots & \vdots & \ddots \\ a_{n1} & a_{n2} & \ldots & a_{nn} \end{bmatrix} \cdot \begin{bmatrix} b_{11} & b_{12} & \ldots & b_{1n} \\ b_{21} & b_{22} & \ldots & b_{2n} \\ \vdots & \vdots & \vdots & \ddots \\ b_{n1} & a_{n2} & \ldots & b_{nn} \end{bmatrix}$$

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0.6 $c_{ij} = \sum_{1 \leq k \leq n} a_{ik}.b_{kj}$

0.7 References

TODO