CS3110

Design And Analysis of Algorithms

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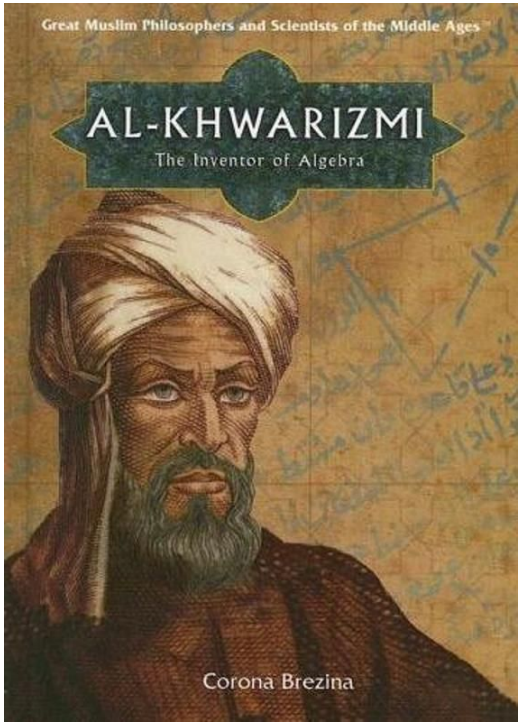
Historical background

Etymologically, the word 'algorithm' is a combination of the Latin word algorismus, named after Al-Khwarizmi, a 9th-century Persian mathematician, and the Greek word arithmos, i.e. αριθμός, meaning "number" .[Wikipedia]

"Algebra" is derived from al-jabr, .. His name is also the origin of (Spanish) guarismo and of (Portuguese) algarismo, both meaning digit.”[Wikipedia]



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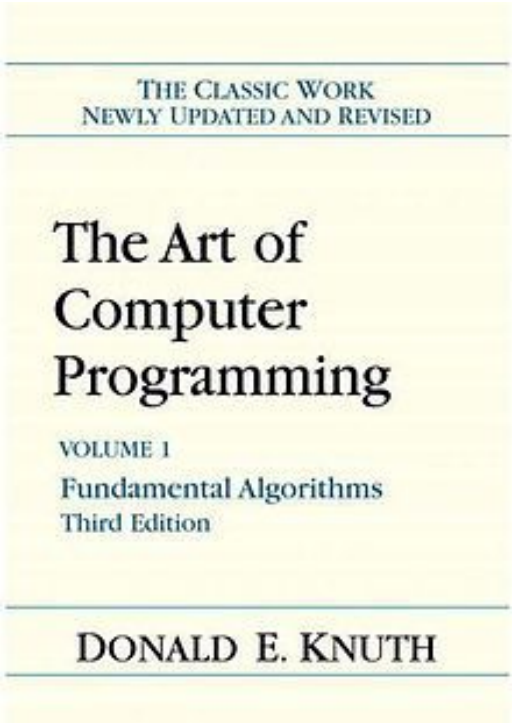
THE CLASSIC WORK
NEWLY UPDATED AND REVISED
The Art of Computer Programming
VOLUME 1
Fundamental Algorithms
Third Edition
DONALD E. KNUTH

Definition of Algorithm

- Informal definition
  - “a set of rules that precisely defines a sequence of operations.” [wikipedia]

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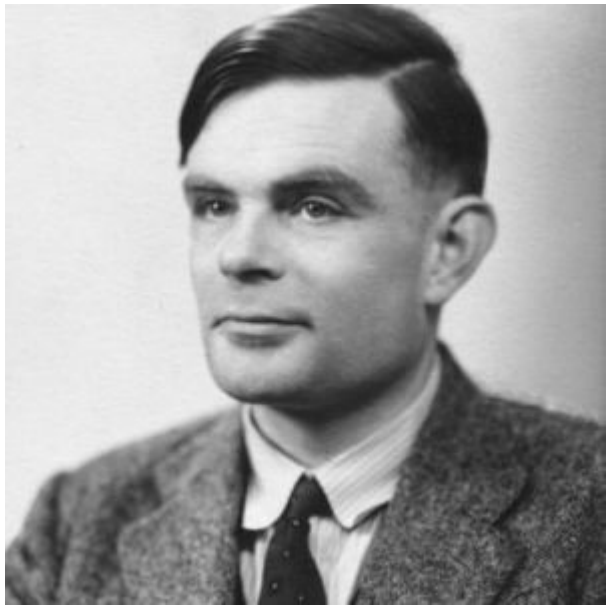
- Formal Definition
  - Turing Machine

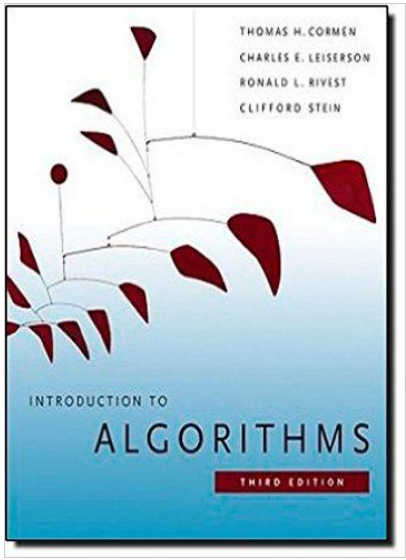


Why do we need this course?

- Algorithms have many applications
  - Write efficient codes
- Computer Science is all about algorithms!
  - Through need several steps of abstraction, every computer science problem can be converted to an algorithm problem
- Ok, it helps to pass job interviews

Text Books

- Required :
  - **[CLRS]** Introduction to Algorithms
  - Slides by Dr. Norbert Zeh
- Other optional resources
  - Wikibook on Algorithms
    - https://en.wikibooks.org/wiki/Algorithms
    - Not complete, but is undergoing improvement
  - *Algorithm Design* by **Jon Kleinberg** and Éva Tardos
    - Slides by Kevin Wayne



Evaluation

- 8 assignments (A)
  - The best 7 assignments count; each has equal weight.
- Midterm (M)
- Final (F)
- Final grade = max(40% * A + 60% * F, 40% * A + 20% * M + 40% * F)

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