CSE-103: Computational Models
Lecture Notes

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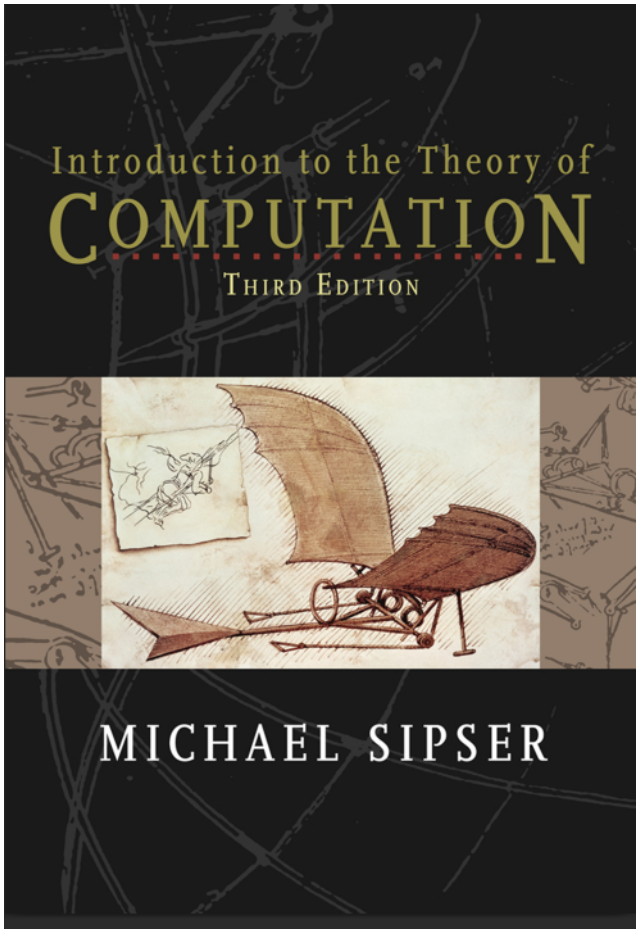
Introduction

Textbooks

1. Introduction to the Theory of Computation by Michael Sipser



Introduction to the Theory of Computation
by Michael Sipser

What is this Doc?

This document shall contain my notes for the class CSE-103: Computational Models offered at UCSC, taught by Assistant Prof. Daniel Fremont. This document will contain notes from the lectures(possibly verbatim?) and may contain some additional information, either from the text or other sources that I find useful.

Lecture 1

Overview of the Course

Learning Objectives

After taking this course, you will be able to:

1. Interpret and design finite automata (DFAs and NFAs) and regular expressions.
2. Interpret and design context-free grammars (CFGs) and pushdown automata.
3. Prove basic properties of regular and context-free languages.
4. Interpret and design Turing machines(TMs).
5. Prove basic languages are decidable or Turing-recognizable.
6. Construct reductions between problems and apply such reductions to establish undecidability of problems
7. Construct polynomial-time algorithms/verifiers and polynomial-time reductions and use them to show languages are in P, NP, or are NP-complete.

Outline of the Course

Lecture 2: