

Section 2.1: Context-free Grammars

These exercises reflect material from our text, *Introduction to the Theory of Computation*, by Michael Sipser, PWS Publishing Co., 1997.

Definitions

Define each of the following concepts:

- (a) Context-free language, CFL
- (b) Context-free grammar, $G = (V, \Sigma, R, S)$
- (c) Derivation
- (d) Language of a context-free grammar
- (e) Parse tree
- (f) Ambiguous context-free language
- (g) Chomsky normal form of a context-free grammar

Results

Any context-free language is generated by a grammar in Chomsky normal form.

Algorithms

Convert any context-free grammar into Chomsky normal form.

Exercises

We will attempt to solve each of the following exercises as a community project in class today. Finish these solutions as homework exercises, write them up carefully and clearly, and hand them in at the beginning of the next class.

Exercises for Section 2.1, pages 119–120: 1, 2, 3, 4