

Section 1.4: Non-regular Languages and the Pumping Lemma

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) Pumping Lemma for regular languages
- (b) Pumping length
- (c) Finite state transducer, FST

Results

Sketch the proof of the following theorem:

The language L is regular iff

- (i) L is accepted by a DFA
- (ii) L is accepted by an NFA
- (iii) L is described by a regular expression.

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 1.4, pages 86–88: 17, 18, 19, 20, 21, 22