

Lexical Analysis

Exercise 1

For the given regular expression:

$$a + (b \mid de)^*$$

1. draw NFA (Non-deterministic Finite Automaton).
2. transform NFA to DFA (Deterministic Finite Automaton).

Exercise 2

Explain why there are no regular expressions which can express the language $a^n b^m$ where $n > m$. This means language over the alphabet a, b where there are always more a s than b s.

Exercise 3

Write a regular expression for a 7 digit phone number with country code (i.e. +1 for USA, +41 for Switzerland, +381 for Serbia, +1246 for Barbados. There are no 5 digit country codes) and two digit area code.

Examples (area codes are in bold for emphasis):

+1246**68**1245783

+381**64**2521515

+41**31**5119636

+1**12**1234567

Exercise 4

Write a regular expression for an integer number of distance units (take into account only millimeters, centimeters, decimeters, meters and kilometers)

Examples:

256mm

128cm

64dm

32m

16km