



Assignment 3

Lexical Analysis

Consider the following regular expression:

$$(c|ab)^*a$$

Assignment 3.1: Thompson's Construction

Construct a non-deterministic finite automaton (NFA) to recognise the above regular expression using Thompson's Construction.

Assignment 3.2: Subset Construction

Convert the resulting non-deterministic finite automaton (NFA) of the previous assignment into a deterministic finite automaton (DFA) using Subset Construction.

Assignment 3.3: Hopcroft's Algorithm

Minimise the resulting deterministic finite automaton (DFA) of the previous assignment using Hopcroft's Algorithm.

Assignment 3.4: Direct-coded Scanner

Construct a direct-coded scanner based on the resulting minimal deterministic finite automaton (DFA) of the previous assignment.

Note:

It is crucial to follow the algorithms mentioned above and not your intuition, despite the simplicity of the regular expression considered. Describe intermediate steps and partial results to illustrate your systematic approach.

Note:

This assignment shall be submitted in groups of two participants, same groups as for the CiciC compiler project.

Assignment due date: Friday, November 14, 2025