

# Compiler Construction

Hans de Nivelle

Due: 21 October 2009

Solutions should be handed in.

1.
  - (a) Give a regular expression for decimal integers, possibly preceded by a unary `-` or a unary `+`.
  - (b) Give a regular expression for C-style strings. Do not forget to allow escapes of form `\n`, `\t`, `\'`, `\"`, `\XYZ`, where XYZ is an octal number.
  - (c) Give a regular expression for Pascal-style strings. (As far as I know, Pascal strings have no escape sequences, but one can use double quotes.) `'this is a pascal string with a quote (') in it'`.
  - (d) Same for C-style comments, starting with `/*` and ending with `*/`.
  - (e) Same for C-style comments that start with `//` and last till the end of the line.
  - (f) Give a regular expression for full Unix file names.
  - (g) Give a regular expressions that accepts all words over  $\Sigma = \{a, b, c\}$  that contain each of the letters in  $\Sigma$  at least once. Could you describe a similar regular expression for the complete alphabet  $\Sigma' = \{a, b, c, \dots, z\}$ ?
2.
  - (a) Using the translation scheme on the slides, translate the following regular expression into an NFA

$$(a|b)^*abc.$$

- (b) and also:

$$(\epsilon|aa|bb)^*c.$$

- (c) The regular expression in task 1d.
- (d) The regular expression in task 1g, (the first one)