COMP 442

Assignment 1

Ricardo RAJI CHAHINE

ID 40234410

2026-01-25

Analysis:

Lexical specifications as regular expressions – document Section 1.	ind 2.1	2 pts

I decided to restrict the grammar, and so chose to logic similar to lexnegativegrading.alternative1. This created in turn less tokens and allows to focus on later semantics rather than syntax. Shift the responsibility of syntax to the programmer.

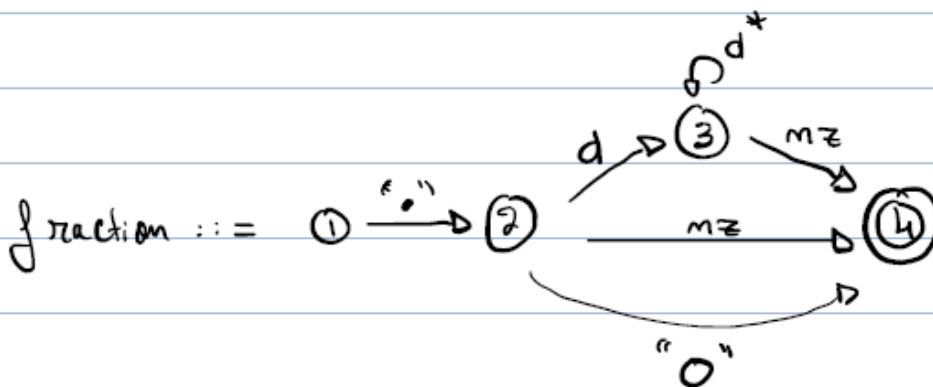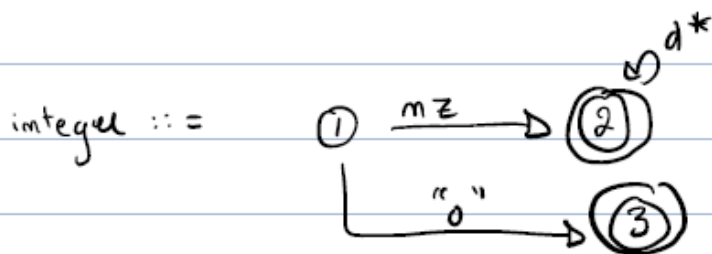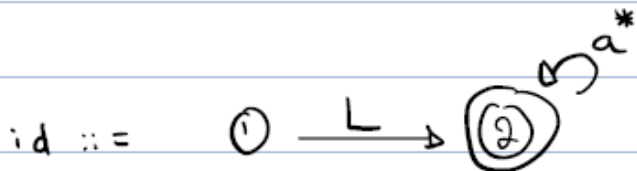| Finite state automaton representing the implementation, and description of the method used to generate the automaton from the regular expressions – document Section 2.	ind 2.2	3 pts

$L \equiv letter \equiv [a..z] \mid [A..Z]$
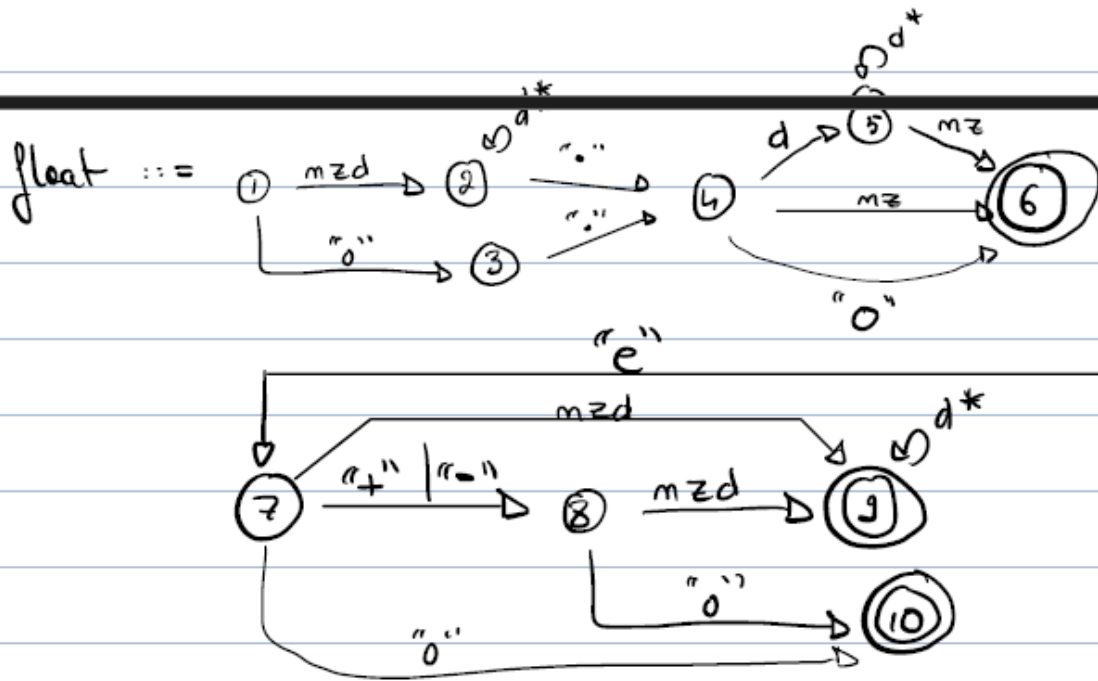
$d \equiv digit \equiv [0..9]$

$a \equiv alphanum \equiv (L \mid d \mid "\_")$

$mz \equiv nonzero \equiv [1..9]$

$fraction \equiv . \ digit^* \ nonzero \mid .0$

$id ::=$

$integer ::=$

$fraction ::=$

float ::= (1) mzd (2) $\overset{a^*}{\circlearrowleft}$ "." (4) $\overset{d}{\to}$ (5) $\overset{d^*}{\circlearrowleft}$ mz (6)

$\overset{"0"}{\to}$ (3) "."

(5) $\xrightarrow{mz}$ mz (6)

"O"

"e"

mzd

(7) $\overset{"+"|"-"}{\to}$ (8) $\xrightarrow{mzd}$ (9) $\overset{d^*}{\circlearrowleft}$

"0"

"0" → (10)

↳ for example these are valid :   0.0e+0

0.0e-0

0.e0

12.0

Design:

Description/rationale of the overall structure of the solution and the roles of the individual components used in the applied solution to the stated problem – document Section 3.	ind 4.3	2 pts

- Take in file
- Read line by line
- Scan each token
    - Check whether single character operator ex "+"
    - Check whether comment
    - Check whether digit (integer or float)
    - Check whether alphanumerical first char and then ID

- o Check whether is needs additional tokens ex: "<="
  - ▪ If yes, find it and backtrack once done
- o Save in vectors for all_tokens and invalid_tokens
- Continue until eof.
- Write in the appropriate .outlextokensflaci and .outlextokens files

Correct implementation according to the stated problem.	ind 4.4	20 pts

 DONE (Code.)

Error reporting – Output of clear error messages (error description and location) in the **outlexerrors** file.	ind 4.4	3 pts

 DONE (input_file_name.outlexerrors)

Output of token stream in the **outlextokensflaci** file.	ind 4.4	3 pts

 DONE (input_file_name.outlextokensflaci)

Error recovery – the lexical analyzer continues running after errors are found.	ind 4.4	2 pts

 DONE (CODE.)

Completeness of test cases (in addition to the grading files).	ind 4.4	10 pts

 File: My-tests/test1.src

Tools:

Description of tools/libraries/techniques used in the analysis/implementation. Description of other tools that might have been used. Justification of why the chosen tools were selected – document Section 4.	ind 5.2	2 pts

Could have used Flaci to draw the DFA.

Successful/correct use of tools/libraries/techniques used in the analysis/implementation.	ind 5.1	3 pts

- DFA by hand
- Design by hand