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CMPT 432L-111: Design of Compilers
Lab 2
Due: 2017-01-24
Instructor: Dr. Alan G. Labouseur

Lab 1

Exercise 3.3. *Write regular expressions that define the stings recognized by the FAs in Figure 3.33 on page 107.*

Answer.

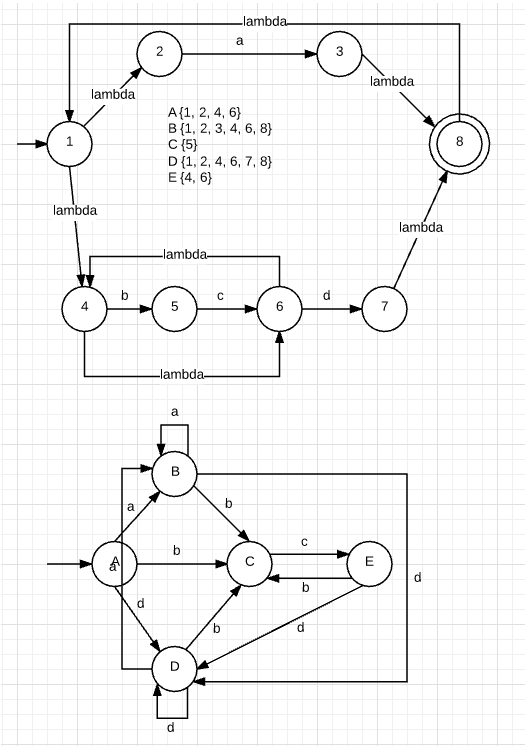
- a) $(ab^*a)|(ba^*b)$
- b) $(a)|(abcda)|(ac^*da)$
- c) $(^\$)|(ab^*c)$

Exercise 3.4. *Write DFAs that recognize the tokens defined by the following regular expressions:*

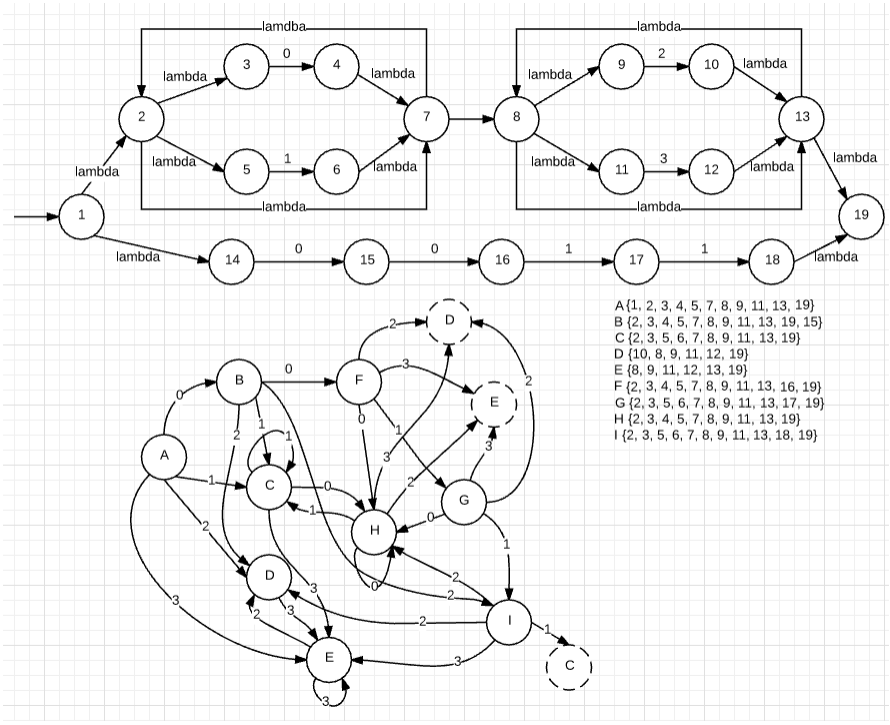
- *a)* $(a|(bc)^*d)^+$
- *b)* $((0|1)^*(2|3)^+)|0011$
- *c)* $(aNot(a))^*aaa$

Solution.

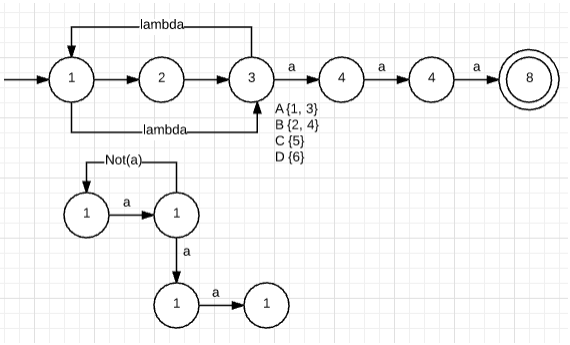
3.4a



3.4b



3.4c



Exercise 3.5. *Write a regular expression that defines a C-like, fixed-decimal literal with no superfluous leading or trailing zeros. That is* 0.0, 123.01, *and* 123005.0 *are* ***legal****, but* 00.0.001.000, *and* 002345.1000 *are* ***illegal****.*

Answer.

- Let DNOTZ be the set of digits from 1 to 9.
- Let D be the set of digits from 0 to 9.

Define $(0|(DNOTZ\ \ D^*).(0|D^*\ \ DNOTZ))$.

Define $\hat{}(0|[1-9][0-9]^+)\backslash.([0]|[0-9]^*[1-9]\$)$. (Real Regex)

Exercise 3.3.4. *Most languages are* ***case sensitive****, so keywords can be written only one way, and the regular expressions describing their lexeme is very simple. However, some languages, like SQL, are case insensitive, so a keyword can be written either in lowercase or in uppercase, or in any mixture of cases. Thus, the SQL keyword SELECT can also be written select, Select, or sElEcT, for instance. Show how to write a regular expression for a keyword in a case insensitive language. Illustrate the idea by writing the expression for "select" in SQL.*

Answer.

$select \rightarrow [Ss][Ee][Ll][Ee][Cc][Tt]$
