CECS 424
Assignment 4
Total: 40 Points
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General Instruction

- I recommend that you can type your answers by using LATEX.
- Submit your work via BeachBoard (Not email or in class).

1. (15 points) Write a POSIX standard regular expression to capture the hexadecimal floating-point values. A hexadecimal floating-point value begins with 0x or 0X, may contain the digits 0–9 and a/A–f/F, and has an optional fractional portion (beginning with a dot) and a mandatory exponent (beginning with P or p). There may be digits to the left of the dot, the right of the dot, or both, and the exponent itself is given in decimal (contains only the digits 0-9), with an optional leading + or - sign. A hexadecimal floating-point value may end with an optional F or f (indicating "float"-single precision) or L or l (indicating "long"-double precision). You can verify your answer using an online regex testers such as https://regex101.com/.

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[0x|0X] ([\d|a-fA-F]*[(\d|a-fA-F)\.|\.(\d|a-fA-F)][\d|a-fA-F]*)[p|P][+-]?[\d]*[fF|lL]
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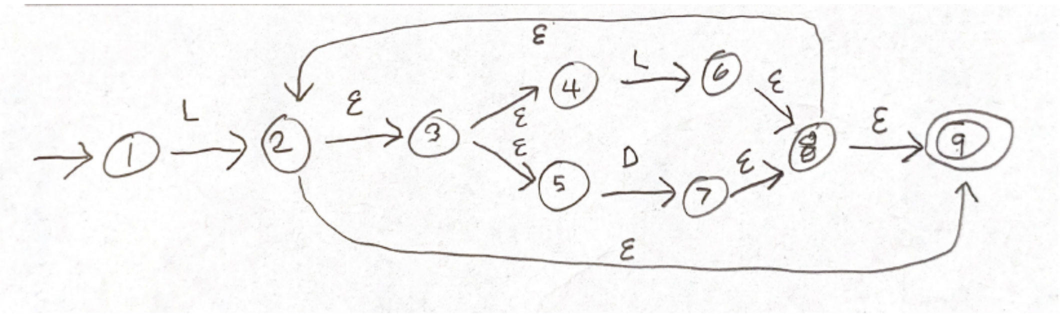
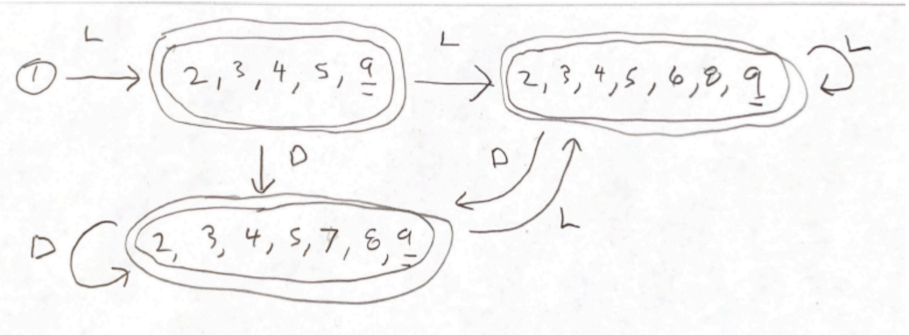
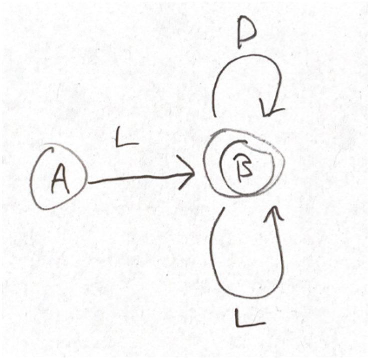
2. (a) (5 points) Transform the regular expression letter (letter | digit) ∗ to a NFA.



(b) (5 points) Create an equivalent DFA.

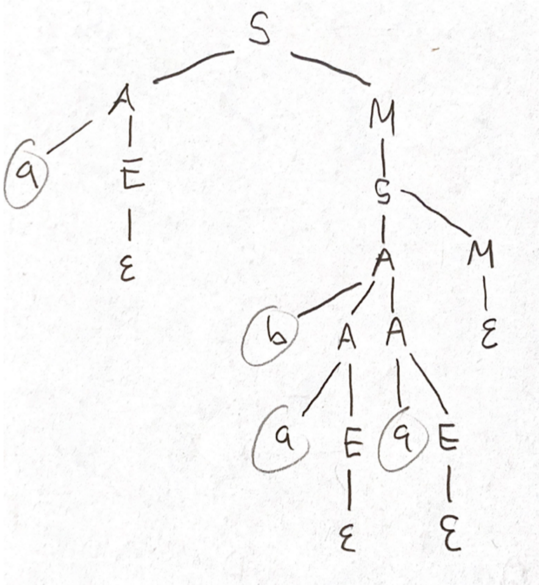


(c) (5 points) Minimize the DFA.



3. (10 points) Show the left-most parse tree for the string a b a a.

Terminal symbols: {a, b}
S -> A M
M -> S | ε
A -> a E | b A A
E -> a B | b A | ε
B -> b E | a B B


S
A
M
a
E
ε
S
A
M
b
A
A
ε
a
E
a
E
ε
ε