University of Central Florida
School of Computer Science
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T1

1. Consider integers written in base 3 with no leading 0s. Let L_1 be the set of such strings which represent odd numbers.

   (a) Construct a DFA that accepts L_1.

   (b) Construct a left-linear grammar for L_1.

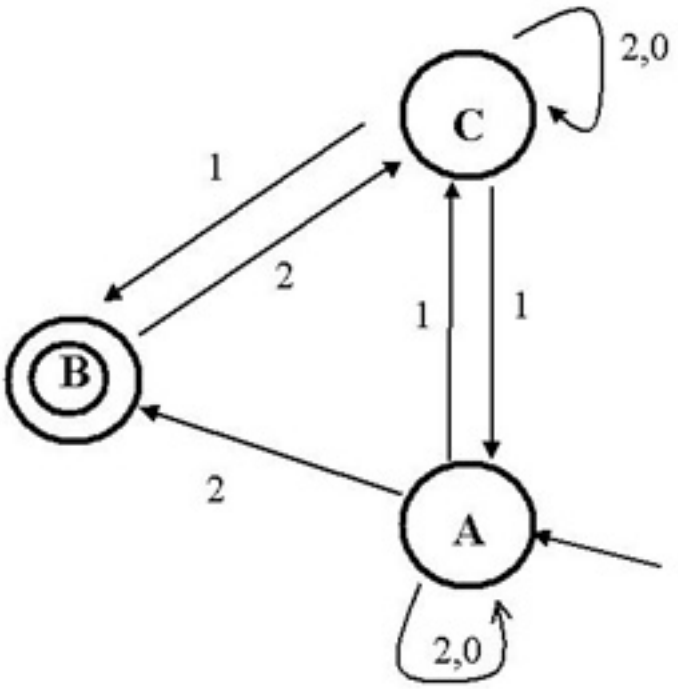
2. Consider the language L_2 generated by the following grammar

$$\begin{aligned} S &\rightarrow AB + C \\ A &\rightarrow aB + C \\ B &\rightarrow Ab + C \\ C &\rightarrow b + aaaC \end{aligned}$$

   Characterize L_1 using a combination of set notation and regular expressions.

3. What does it mean for an infinite set to be "countable"?

4. Construct a DFA equivalent to the following NFA.



5. Consider the language over $\Sigma = \{a, b, c\}$ consisting of strings with more occurrences of the pattern "abc" than occurrences of the pattern "abb". Is this a regular language? Justify your answer.