Assignment 10

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Assignment 10 consists of two required problems and one optional bonus problem. You are required to write your solutions using LaTeX.

Submit the following files to the Assignment 10 folder on Avenue under Assessments/Assignments:

1. A file named `Assignment_10_YourMacID.tex` that is a copy of the LaTeX source file for this assignment (`Assignment_10.tex`) with your solutions entered after each problem. *YourMacID* must be your personal MacID.

2. A file named `Assignment_10_YourMacID.pdf` that is the PDF output produced by executing

   `pdflatex Assignment_10_YourMacID`

3. Any additional files that are needed to produce the PDF output. These should be given names that begin with `Assignment_10_YourMacID_`.

This assignment is due **Sunday, April 1, 2018 before midnight.** You must write your name and MacID at the bottom of the LaTeX file. You are allowed to submit the assignment multiple times, but only the last submission will be marked. **Late submissions and files that are not named exactly as specified above or are missing your name or MacID will not be accepted!**

Although you are allowed to receive help from the instructional staff and other students, your submitted program must be your own work. Copying will be treated as academic dishonesty!

Required Problems

1. **[10 points]** Construct a regular grammar that generates the language matched by the regular expression $(000^* + 111^*)^*$.

   A possible regular grammar that generates the language matched by the above expression is denoted by G:

   G = ({S, A, B, C, D, E, F }, {0, 1}, P, S)
   Where P is the set of productions below $S \Rightarrow A|B|\epsilon$
   $A \Rightarrow 0C$
   $B \Rightarrow 1D$
   $C \Rightarrow 0E$
   $E \Rightarrow 0E|\epsilon|S$
   $D \Rightarrow 1F$
   $F \Rightarrow 1F|\epsilon|S$

2. **[10 points]** Let $\Sigma = \{a, b\}$ and $L = \{x \in \Sigma^* \mid x \neq \mathsf{rev}\ x\}$. Construct a simple grammar for L as well as grammars in Chomsky and Greibach normal form for L.

   Put your three grammars here.

Bonus Problem

[5 bonus points] Prove that, if a CFG G is right linear, then $L(G)$ is regular.

Put your proof here.

Name and MacID

Name: **Put your full name here.**

MacID: **Put your MacID here.**