CSCI 340 – Homework 7

Dr. Schwartz

- 1. Show the following CFG generates the language defined by the RE $\mathbf{a}^*\mathbf{b}\mathbf{b}$ $S \rightarrow aS \mid bb$
- 2. Find a CFG for each of the following:
 - (a) All words in which the letter b is never tripled
 - (b) All words that have different first and last letters
 - (c) All words that don't have the substring *ab*
- 3. Describe the language generated by the following CFG:
 - $S \rightarrow SS$

$$S \rightarrow XXX$$

- $X \rightarrow aX \mid Xa \mid b$
- 4. Write a CFG to generate the language MOREA. By definition MOREA contains all strings that have more *a*'s than *b*'s
- 5. Show the following CFGs are ambiguous

(a)
$$S \rightarrow XaX$$

 $X \rightarrow aX \mid bX \mid \Lambda$
(b) $S \rightarrow aSX \mid \Lambda$
 $X \rightarrow aX \mid a$

6. For the CFGs in the previous question, provide a non-ambiguous CFG