CS5003
Homework #5

Please list the people and URL's you consulted:

#1. Let G be a grammar in Chomsky Normal Form. Fill in the following table.

w	|w|	length(derivation)	max depth(tree)	min depth(tree)
ε	0	1	1	1
a_1	1	1	1	1
$a_1\, a_2$	2	3	2	2
$a_1\, a_2\, a_3$	3	5	3	3
$a_1\, a_2\, a_3\, a_4$				
$a_1 a_2 a_3 a_4\, a_5$				
$a_1\, a_2\, a_3...a_n$	n			

#2. Convert the following grammar to Chomsky Normal Form:

S→ A | A B a | A b A
A → A a | ε
B → B b | BC
C → C B | C A | b B

#3. Show context free languages are closed under reversal. Show your method on
$\{ab^n \mid n \geq 0 \}$

#4. Given a context-free grammar G, and a string w, how could you decide if w ε L(G)?
(Hint: See #1 or #5)

#5. Given G in Greibach Normal Form and w ε L(G), what is the length of the derivation
of w?