Computer Science Department,
California State University, Fullerton

Compilers & Languages

ASSIGNMENT 2

Please answer to the questions appropriately, and if you believe a diagram is required, draw one.

If you want to solve the problems, do so while documenting your steps.

NOTE: Please avoid from writing single-word responses or the just the single solution to a **problem**.

Maximum score is 50 points

Questions:

1. What is Context Free Grammar? Give an example.
2. What is BNF and Extended BNF?

3. Eliminate left recursion from:
   $E \rightarrow Ea \mid b$
   $A \rightarrow c \mid d$

4. For the following grammars and string s, give (a) a parse tree (b) a left-most derivation, and (c) a right-most derivation.

   $S \rightarrow A\ B$
   $A \rightarrow aA/c$
   $B \rightarrow Bb/d$

   Input String : **acdb**

5. Construct a Push Down Automata for Language L = $\{0^k 1^m$, where k>=1, m>=1, m>n+2$\}$

6. Identify whether the given grammar satisfies the LL(1) parser condition. If the grammar is not LL(1), explain why it is not or it is.

   $X \rightarrow a\ Y \mid Z$
   $Y \rightarrow a \mid c$
   $Z \rightarrow b\ Y$

7. Consider the Grammar

   $A \rightarrow a\ B\ d$

   $B \rightarrow b\ c \mid b$

   Construct a parse tree for the string **abd**. Also, when the incorrect alternative is selected, display the parse Tree (So you must illustrate all the paths, including incorrect and correct alternatives, as well as how it is being backtracked.)

8. Construct the SLR (1) parser for the following grammar

   $S \rightarrow BB$

   $B \rightarrow cB/\ D$

   $D \rightarrow g$

   Also check if the input **c+g** could be parser or not.

9. Explain what LR(0) items are and what functions are do we have in it.

10. Explain the difference between LR(0) parser and SLR(1) parser.