

CS 3721: Programming Languages Lab

Lab #02: Syntax Of Programming Languages.

The purpose of this recitation is to lead you through a few exercises of expressing the syntax of simple programming languages.

1. Define BNF for the following languages. Is your grammar ambiguous? If yes, rewrite to be non-ambiguous.
 - (a) All strings composed over the set of terminals { a, b, c}. Give an input string of the language and draw a parse tree and an AST for your sample input.
 - (b) All strings composed over the set of terminals { a, b, c} that start with b.
 - (c) All strings composed over the set of terminals { a, b, c} that start with b and end with c.
 - (d) All strings composed over the set of terminals { a, b, c} that have length ≥ 4 . Give an input string of the language and draw a parse tree and an AST for your sample input.
 - (e) All strings composed over the set of terminals { a, b, c} that start with b and end with c, and have length ≥ 4 .
 - (f) All strings composed over the set of terminals { a, b, c} that contain an odd number of tokens.
2. Give a context-free grammar for a small graph description language. The terminals of the language include all integers composed of digits '0', '1', ..., '9', '(', ')', ';', and '->'. Each node of the graph is represented by an integer number. Each edge is represented by a pair of nodes connected with '->'. For example, 3->4 is an edge from node '3' to node '4'. Each graph description is a sequence of edges surrounded by a pair of parentheses. Write down the meaning of each non-terminal used in your BNF. Give a parse tree and an abstract syntax tree for the input graph (1->2; 2->5; 5->1)

Submission instructions: To submit online, go to

<http://www.cs.utsa.edu/~cs3723>

Fill in the proper information and upload your solution file. To submit in paper, hand in your paper to the TA before leaving the recitation.