

COP4020 Homework Assignment 5

For all assignments submitted via Blackboard:

- I. Put your name and both usernames (FSU/Blackboard and CS) on the paper.
- II. Write the question/problem verbatim in your paper, then give your answer/solution.
- III. After completing the paper, save as a pdf file.
- IV. Submit the pdf file to Blackboard using the Assignments tab.
- V. There is no need to name the file anything other than "hw?.pdf" [? = assignment number], the submission will be associated with your username automatically.

1. Augment the following grammar of nested parenthesis with semantic rules to count the number of opening parenthesis:

$$\langle \text{parens} \rangle \leftarrow (\langle \text{parens} \rangle)$$
$$\langle \text{parens} \rangle \leftarrow \epsilon$$

The synthesized attribute *parens.num* should hold the number of opening parenthesis.

2. Draw a decorated parse tree of the input $((()))$ using the augmented grammar of #1 above.
3. Write (on paper) a recursive descent parser (in Pseudo code or a programming language of your liking) for the augmented grammar of #1 above.
4. Textbook exercise 4.5 (same for ed 2 & 3).