

CS 350 Programming Language Design Homework Assignment (2)

Objectives

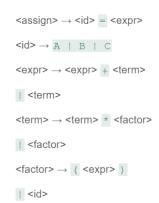
- 1. Understand language grammar written in BNF
- 2. Perform derivation on grammar rules
- 3. Draw parse trees
- 4. Understand operational semantics

Description

- Q1. Consider the given grammar:
 - a. (15 points) draw a parse tree for:

$$B = A * (C * (B + A))$$

- **b.** (15 points) Show a <u>rightmost</u> derivation for the statement in a.
- c. (15 points) Rewrite the grammar to add the ++ and -- operators
- d. (15 points) Rewrite the grammar in EBNF



- Q2. Consider the Ruby case statement:
 - a. (20 points) Describe the syntax in BNF
 - **b.** (20 points) Using the virtual machine instructions given below, give an <u>operational</u> semantic definition of the statement.

```
ident = var
ident = ident + 1
ident = ident - 1
goto label
if var relop var goto label
In these statements, relop is one of the relational operators from the set {=, <>, >, <, <=, <=}, ident is an identifier, and var is either an identifier or a constant. These</pre>
```

Note:

Hand written answers are OK for Q1 parts **a** and **b**. In this case, comine a neatly organized scanned version of your answer with your "pdf" submission file.