Trushal Varma

Professor Fang Li (Org. computer Languages)

Homework 1
Due: Feb. 16th 2020

1. What are programming language evaluation criterias? (Choose all that apply) (1 point)

   a. Readability
   b. Writability
   c. Reliability
   d. Cost

2. When talking about readability, "every possible combination of primitive constructs is legal" leads to which term? (1 point)

   a. Simplicity
   b. Orthogonality
   c. Expressivity
   d. Flexibility

3. When talking about reliability, "Presence of two or more distinct referencing methods for the same memory location" leads to which term? (1 point)

   a. Type checking
   b. Exception handling
   c. Aliasing
   d. Support for abstraction

4. Which feature does **NOT** belong to imperative languages? (1 point)

   a. Data and programs stored in memory
   b. Memory is separate from CPU
   c. Main means of making computations is by applying functions to given parameters
   d. Instructions and data are piped from memory to CPU

5. What are the three main programming language implementation methods? (1 point)

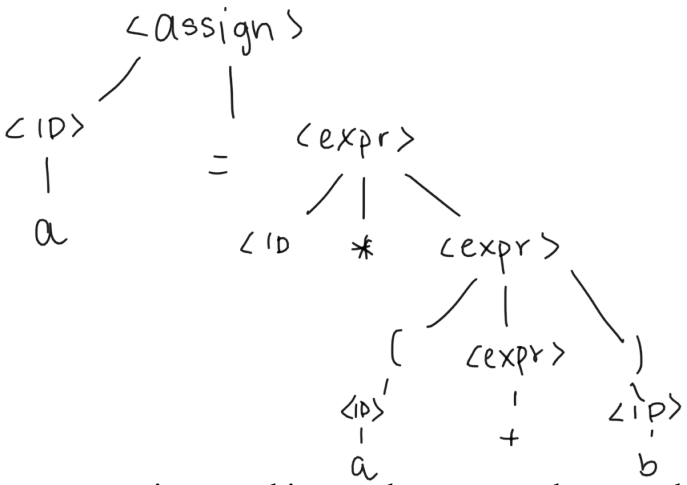
   a. Compilation
   b. Pure interpretation
   c. Hybrid implementation
   d. Push-down automata

6. Compilation process consists of several phases. What are they? (Choose all that apply) (1 point)

   a. Lexical analysis
   b. Syntax analysis
   c. Semantics analysis
   d. Code generation

7. Given grammar: <assign> → <id> = <expr>
   <id> → A| B | C
   <expr> → <id> + <expr> | <id> * <expr> | (<expr>) | <id>

   a. Please draw the parse tree for sentence **a = c * (a + b)** (2 points)



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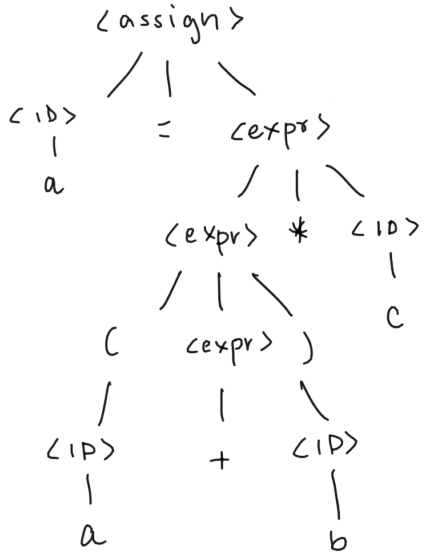

   b. The given grammar is not ambiguous, but can you do some change to make it ambiguous? Prove the ambiguity (by showing two distinct parse trees for the same sentence). (2 points)

a = C x (a+b)

a = (a+b) * C

<assign> → <ID> = <expr>

<ID> → A|B|C

<expr> → <exp> + <exp | <epr> * <exp> | (<expr>) | <ID>

gives the same answer but gives precendece to different operator when parsing.