Due: 4月 11日 上傳電子檔到tronclass

Example 3.4

<assign -> <id> = <expr>

<id> -> A|B|C

<expr> -> <expr> +<term>

 | <term>

<term> -> <term>\*<factor>

 |<factor>

<factor> -> (<expr>)

 |<id>

1. Write the BNF for the following operators.

Line1 && ||

Line2 < <= =

 Line3 + -

Line4 \* /

Line5 ( )

 All of these operators are left associative. All operators on the same line have the same precedence. The lines are in order of increasing precedence. The use of “&&” and “||” are:

 A && B

 A || B

 (A || B) + C

The BNF of “id” is:

<id> -> A|B|C

1. Write (1) EBNF, and (2) the syntax chart in question 1.

3. For each of the following strings, draw parse trees and abstract syntax trees with respect to the grammar in question 1:

 (a) (A + B) \* C

(b) P && (Q || R + S)

4. Prove that the following grammar is ambiguous

 <S> -> <A>

 <A> -> <A> + <A> | <A> - <A> | <id>

<id> -> a|b|c

5. Write a regular expression for floating-point numbers

Example:

 Allowed floating-point numbers:

 203.0102 203.0102000

 0.13 0.13000

 .13 .13000

 +23.12 +23.12000

 +.13 +.13000

 -23.12 -23.12000

 -.13 -.13000

 Invalid floating-point numbers:

 0203.102

 000.12

 +0203.102

 -000.12