UNIVERSIDADE FEDERAL DO OESTE DO PARÁ

INSTITUTO DE ENGENHARIA E GEOCIÊNCIAS

COMPILADORES

Alexandre Lopes de Sousa; Débora Aparecida Brito Cavalcante; Lucas de Andrade Amaral; Selena Crixi Miranda Leão.

4 - Gramática que gera expressões aritméticas que incluem: [i] operadores binários de soma (+), subtração (-), multiplicação (*) e divisão (/); [ii] operadores unários de soma (+) e subtração (-); [iii] operadores de pré-decremento (<) e pré-incremento (>); e [iv] operadores de pós-decremento (<) e pós incremento (>). As expressões podem conter parênteses e os operandos são letras ou dígitos.

EXPR ::= EXPR + TERM | EXPR - TERM | TERM
TERM ::= TERM * UNARY | TERM / UNARY | UNARY
UNARY ::= + UNARY | - UNARY | < ID | > ID | POST
POST ::= ID > | ID < | FACTOR
FACTOR ::= (EXPR) | ID | DIGIT
ID ::= a | b | ... | z
DIGIT ::= 0 | 1 | ... | 9

a) **Gramática ajustada para LL(1):**
   EXPR ::= TERM EXPR'
   EXPR' ::= + TERM EXPR' | - TERM EXPR' | ε
   TERM ::= UNARY TERM'
   TERM' ::= * UNARY TERM' | / UNARY TERM' | ε
   UNARY ::= + UNARY | - UNARY | < ID | > ID | POST
   POST ::= ID > | ID < | FACTOR
   FACTOR ::= (EXPR) | ID | DIGIT
   ID ::= a | b | ... | z
   DIGIT ::= 0 | 1 | ... | 9

b) **Apresentar 5 strings que são aceitas pela gramática, sendo que juntas elas devem utilizar todas as regras da gramática;**
   2+2-2*(2/2)
   -2+3

<a

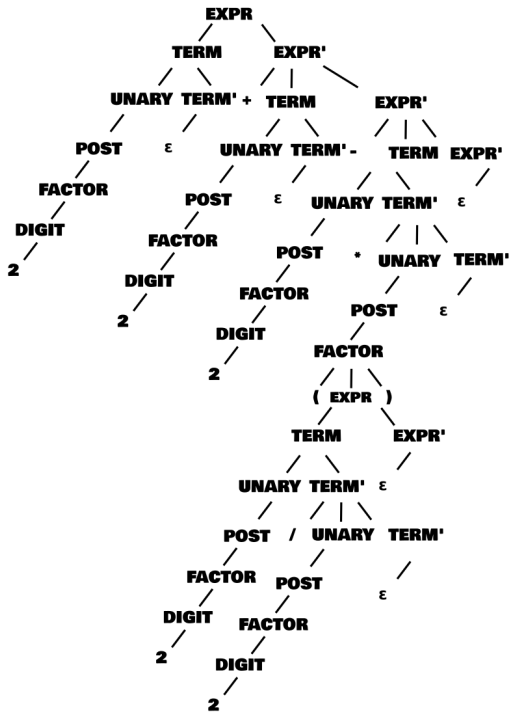
>a + 2

a<

c) **Mostrar a árvore de derivação para cada uma das strings do item anterior.**

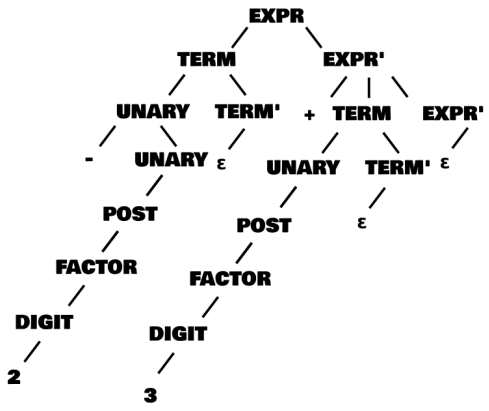
PALAVRA
2+2-2*(2/2)
GRAMÁTICA
EXPR ::= TERM EXPR' **EXPR' ::= + TERM EXPR' | - TERM EXPR' | ε** **TERM ::= UNARY TERM'** **TERM' ::= * UNARY TERM' | / UNARY TERM' | ε** **UNARY ::= + UNARY | - UNARY | < ID | > ID | POST** **POST ::= ID > | ID < | FACTOR** **FACTOR ::= (EXPR) | ID | DIGIT** **ID ::= A | B | ... | Z** **DIGIT ::= 0 | 1 | ... | 9**

ÁRVORE DE DERIVAÇÃO



PALAVRA
-2+3
GRAMÁTICA
EXPR ::= TERM EXPR' **EXPR' ::= + TERM EXPR' | - TERM EXPR' | ε** **TERM ::= UNARY TERM'** **TERM' ::= * UNARY TERM' | / UNARY TERM' | ε** **UNARY ::= + UNARY | - UNARY | < ID | > ID | POST** **POST ::= ID > | ID < | FACTOR** **FACTOR ::= (EXPR) | ID | DIGIT** **ID ::= A | B | ... | Z** **DIGIT ::= 0 | 1 | ... | 9**

ÁRVORE DE DERIVAÇÃO



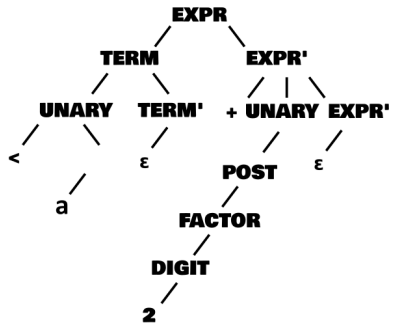
PALAVRA

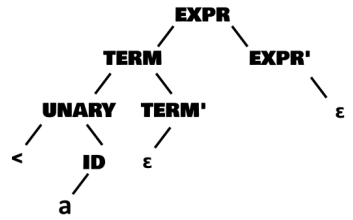
>a + 2

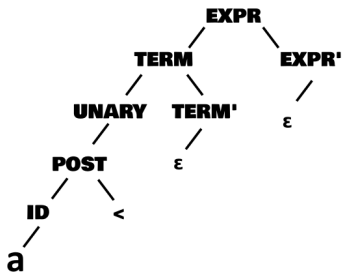
GRAMÁTICA

EXPR ::= TERM EXPR'
EXPR' ::= + TERM EXPR' | - TERM EXPR' | ε
TERM ::= UNARY TERM'
TERM' ::= * UNARY TERM' | / UNARY TERM' | ε
UNARY ::= + UNARY | - UNARY | < ID | > ID | POST
POST ::= ID > | ID < | FACTOR
FACTOR ::= (EXPR) | ID | DIGIT
ID ::= A | B | ... | Z
DIGIT ::= 0 | 1 | ... | 9

ÁRVORE DE DERIVAÇÃO



PALAVRA	ÁRVORE DE DERIVAÇÃO
<a	
GRAMÁTICA	
EXPR ::= TERM EXPR' EXPR' ::= + TERM EXPR' | - TERM EXPR' | ε TERM ::= UNARY TERM' TERM' ::= * UNARY TERM' | / UNARY TERM' | ε UNARY ::= + UNARY | - UNARY | < ID | > ID | POST POST ::= ID > | ID < | FACTOR FACTOR ::= (EXPR) | ID | DIGIT ID ::= A | B | ... | Z DIGIT ::= 0 | 1 | ... | 9	

PALAVRA	ÁRVORE DE DERIVAÇÃO
a<	
GRAMÁTICA	
EXPR ::= TERM EXPR' EXPR' ::= + TERM EXPR' | - TERM EXPR' | ε TERM ::= UNARY TERM' TERM' ::= * UNARY TERM' | / UNARY TERM' | ε UNARY ::= + UNARY | - UNARY | < ID | > ID | POST POST ::= ID > | ID < | FACTOR FACTOR ::= (EXPR) | ID | DIGIT ID ::= A | B | ... | Z DIGIT ::= 0 | 1 | ... | 9	