Logotipo

Descripción generada automáticamente

Laura Belizón Merchán (100452273)

Jorge Lázaro Ruiz (100452172)

Language Processors

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first practice

Recursive Descent Parser

# Design a grammar that represents the previously defined arithmetic expressions.

We designed the following grammar:

Where S is the axiom, N is the nonterminal for the numbers, E is the nonterminal for expressions, P stands for “parameter”, O stands for “operator” and C is the nonterminal that allows us to handle multiple expressions in one line and stands for “continue”. The terminal “n” stands for the newline character, “\n”.

# Determine if it is necessary to transform the above grammar so that it meets the LL(1) conditions.

The grammar defined in the previous section meets all LL(1) conditions. Here is the corresponding LL(1) parse table generated by JFLAP:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | ( | ) | + | 9 | n | $ |
| C | S |  |  | S |  |  |
| E | (OPP) |  |  |  |  |  |
| N |  |  |  | 9 |  |  |
| O |  |  | + |  |  |  |
| P | E |  |  | N |  |  |
| S | EnC |  |  | Nn |  |  |

Where + and 9 are stand-ins for any operator and number, respectively.

# Develop a Recursive Descent Parser according to the grammar of point 2 to process and evaluate expressions in prefix notation.

I don’t know how to document this item without just copypasting [the entire code in drLL.c](https://github.com/JorgeyGari/lp_labs/blob/07424a4304891593fb6ff8475d44975857b1eb74/Delivery%20-%20Recursive%20Descent%20Parser/drLL.c), so there it is.

# Add the possibility to handle simple variables (one character, upper or lower case).

Here is the modified version of the grammar:

Where we added new nonterminals: L represents the left part of the expression, V represents a variable, and A can stand for “assign” or “arithmetic”, since it can be derived into two different productions that complete the expression into either a statement assigning a value to a variable or an arithmetic operation. Clever, I know.