PROJECT PROPOSAL

yaotecatl

Vision and Purpose

Currently there's a huge demand for programmers, but it's still very hard for young boys and girls to get involved with it. Through this project, we want to create an easy way for people of all ages to learn and experience the fun of programming, with the hope that when they're faced with the decision of what major to choose, they pick one related to computer science.

Objetivo

Our principal objective is to develop a programming language that can help people who want to start learning to program. Our language needs to be easy to understand, needs to cover the basic concepts of programming so that the user can understand the simple concepts of programming. To help the people understand better how programming works we are gonna use a tool known as "Blockly" and utilize "PLY" which is an implementation of lex and yacc that uses Python. This tool will help us do the syntactic and lexical analysis of our compiler.

Language requirements

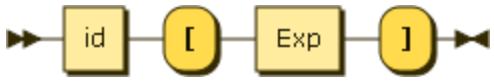
Basic Elements (TOKENS)

Token	Description
Int	Stores integer elements. Example: 14
Array[]	Stores a set of data with the same data type. We can have arrays of Integers, Booleans, etc. Example: ArrayInt = [4,5,6,7]
String	Stores a set of char type values. Example: "tec de monterrey"
Char	Stores elements of type char. Example: 'b'
Float	Stores elements of the type float. Example: 10.45
Bool	Stores elements of type boolean. Example: bool A = false
+ - * /	They are the arithmetic operators to help with

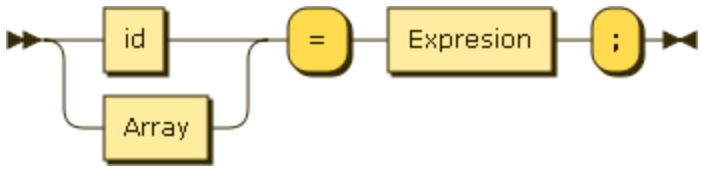
	the calculations. Example: 12 * 3 + 1
<= >= > <	Comparison operators to help with the order Example: 10 > 1
=	Character for all the assignments Example: X = 9
;	Character for all the terminations Example: X = 9;
&& == != ||	Logical operators Examples: 4 && 5 = 4 and 5 3 == 3 = 3 is equal to 3 a != b = a is different than b a || b = a or b
“ “	Characters that help define a string Example: “This is a string”
{ } ( ) [ ]	This set of operators helps us divide pieces of code. Example: if (a != b)
‘ ’	Characters that help define a char. Example: ‘a’

Syntax Diagrams

Array

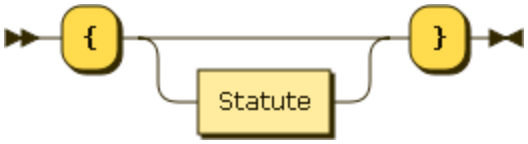


Assignment

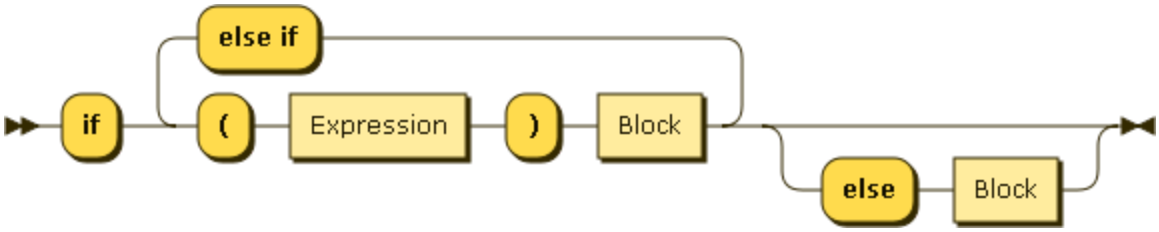


Block_Return

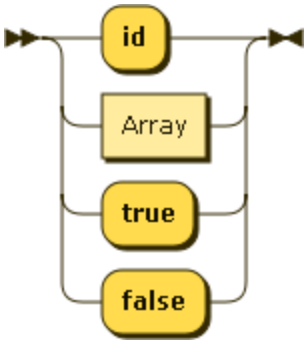
Block



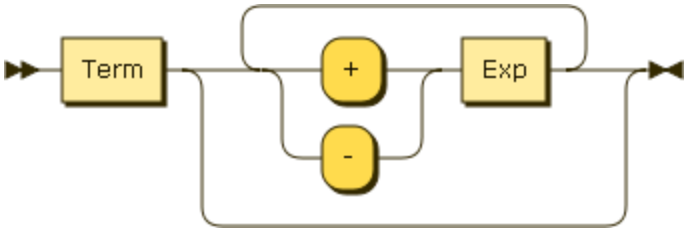
Condition



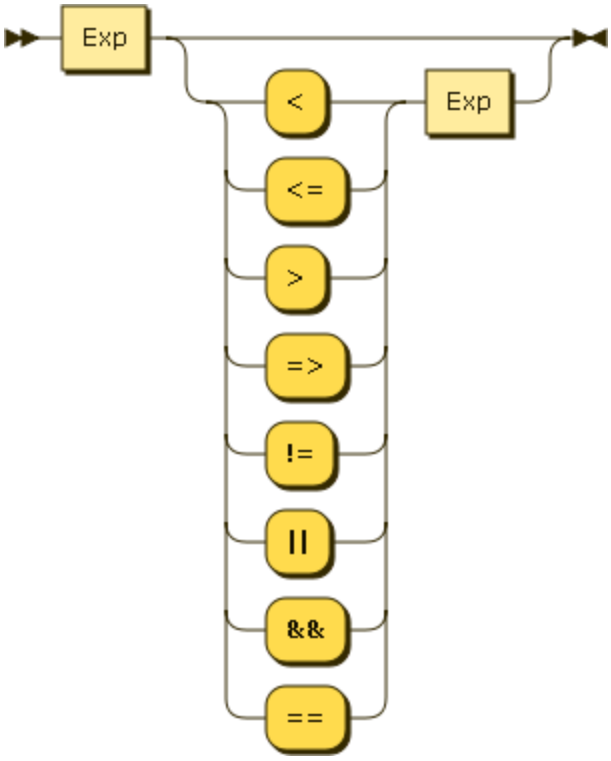
Constant



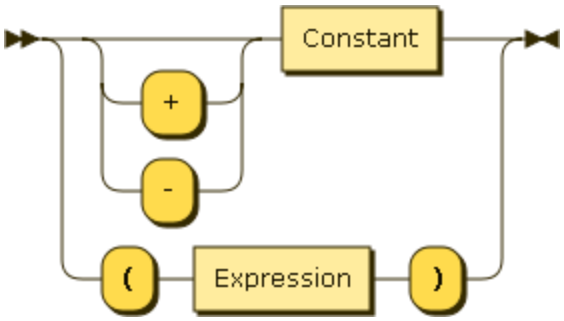
Exp



Expression

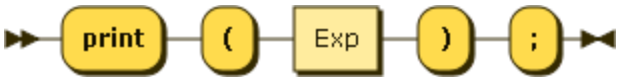


Factor

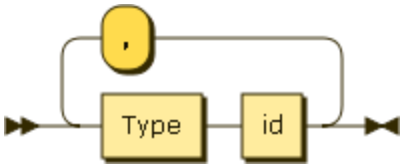


Loop

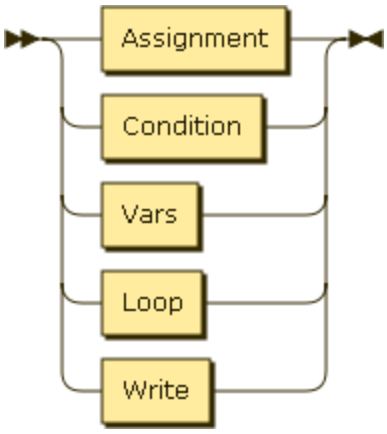
Write



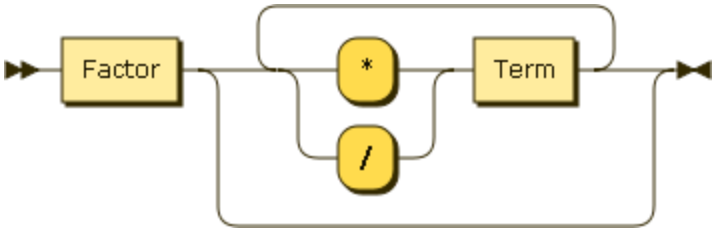
Parameter



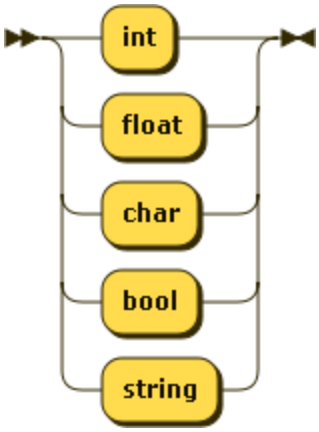
Statute



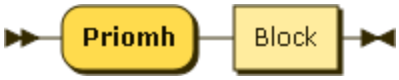
Term



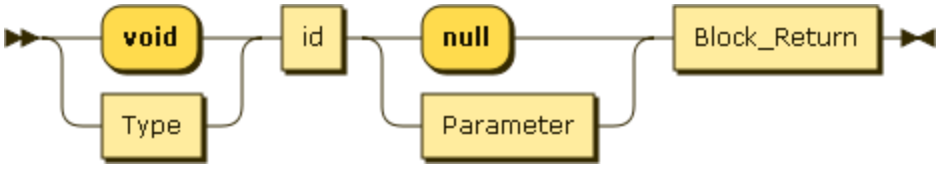
Type



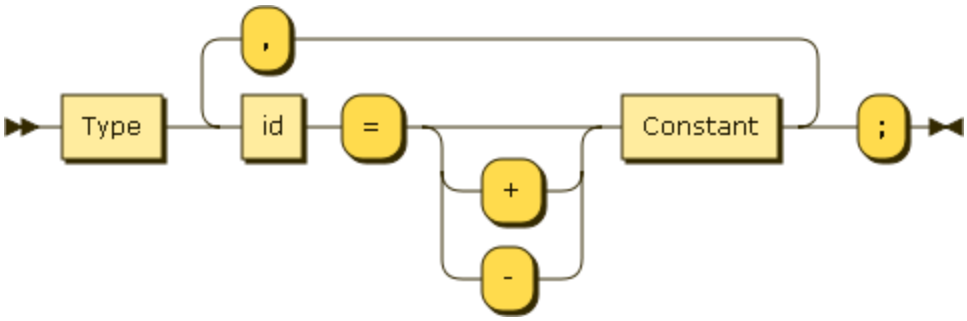
Main



Function



Vars



Name	Syntax Grammar
Array	Array ::= (id '[' Exp ']')
Assignment	Assignment ::= ((id | Array) '=' Expression ';')
Block_Return	Block_Return ::= ('{' (Statue)? ('return' Exp ';')? '}')
Block	Block ::= ('{' (Statute)? '}')
Condition	Condition ::= ('if' (('(' Expression ')' Block) ('else if' '(' Expression ')' Block)*) ('else' Block)?)
Constant	Constant ::= ('id' | Array | 'true' | 'false')
Exp	Exp ::= (Term (('+' | '-') Exp)*)
Expression	Expression ::= (Exp (('<' | '<=' | '>' | '=>' | '!=' | '||' | '&&' | '==') Exp)?)
Factor	Factor ::= ((('+' | '-')? Constant) | ('(' Expression ')'))
Function	Function ::= (('void' | Type) id ('null' | Parameter) Block_Return)
Loop	Loop ::= ('while' '(' Expression ')' Block)

Main	Main ::= ('main' Block)
Parameter	Parameter ::= ((Type id) (',' Type id)*)
Statute	Statute ::= (Assignment | Condition | Vars | Loop | Write)
Term	Term ::= (Factor (('*' | '/') Term)*)
Type	Type ::= ("int" | "float" | "char" | "bool" | "string")
Vars	Vars ::= (Type ((id '=' ('+' | '-')? Constant) (',' id '=' ('+' | '-')? Constant)*) ';')
Write	Write ::= ('print' '(' Exp ')' ';')

Principal Characteristics

- Different functions can be created, they can be of type void or of any of the types we defined on our grammar. The functions can contain any amount of instruction blocks.
- Variables can be defined globally and locally. If two variables are named the same, the local variable will be use first.
- A function can have any number of parameter the user want.
- You cannot use reserved words for a variable name.

Special functions and use instructions in our language

- Priomh(): This is what we are are gonna call our main function

Data Types

Int
Bool
Float
Array
Char

Language and Computer Specifications

We are going to use Python 2.7.12 and we both are going to use a Macbook to develop our programming language.

Bibliography

"Blockly | Google Developers." *Google Developers*. Web. 11 Feb. 2017. <https://developers.google.com/blockly/>.

Beazley, David M. "PLY (Python Lex-Yacc)." N.p., n.d. Web. 11 Feb. 2017. <http://www.dabeaz.com/ply/>.

Gunther Rademache. "Railroad Diagram Generator." *Railroad Diagram Generator*. N.p., n.d. Web. 11 Feb. 2017. <http://www.bottlecaps.de/rr/ui>.

Signatures

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