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Language Specification:

1. Language Definition:

1.1 Alphabet:

1.1.a. (A-Z) (a-z)

b. Underline character '\_';

c. (0-9);

Lexic:

a. Special symbols, representing:

- operators +, -, \*, /, %, <, <=, ==, >=, !=, =, ++, --

- separators [ ] { } ; : space

- reserved words:

if else if else for while print break continue void return int char array

b. identifiers

-a sequence of letters and digits, such that the first character is a letter; the rule is:

identifier = letter| letter {letter} {digit}

letter = "A" | "B" | ...| "Z" | "a" | "b" | ... | "z"

non\_zero\_digit = "1" |"2"|"3"|"4"|"5"|"6"|"7"|"8"| "9"

digit = "0" | non-zero-digit

c. constants

1. integer

integer ="0" | ["+"| "-"] non-zero-digit{digit}

2. character

character = 'letter' | 'digit'

3. string

constchar = "string"

string = char{string}

char = letter | digit

2.2 Syntax:

The words - predefined tokens are specified between " and ":

a) Syntactical rules:

program = stmtlist

stmtlist = stmt | stmt ";" stmtlist

stmt = simplestmt | structstmt

simplestmt = assignment | outstmt

outstmt = "print" "(" identifier ")" ";"

declaration = type identifier

type = "int" | "char"

arraydecl = "array" type "[" nr "]"

cmpdstmt = "{" stmtlist "}"

assignment = identifier “=” expression

expression = expression "+" term | "-" term

term = term "\*" factor | factor

factor = "(" expression ")" | identifier | constant

structstmt = ifstmt | whilestmt | forstmt

ifstmt = “if” “(“ condition “)” stmt | "else" stmt

condition = expression RELATION expression

whilestmt = “while” condition stmtlist

forstmt = “for” “(“ assignment ";" condition ";" “)” stmt

b) lexical rules:

IDENTIFIER = letter | letter{letter}{digit}

letter = "A" | "B" |...| "Z" | "a" | "b" | ... | "z"

digit = "0" | "1" |...| "9"

RELATION = "<" | "<=" | "==" | "!=" | ">=" | ">" | "&&" | "||"

Codification table:

|  |  |
| --- | --- |
| Token type | code |
| [ | 2 |
| ] | 3 |
| { | 4 |
| } | 5 |
| ( | 6 |
| ) | 7 |
| ; | 8 |
| : | 9 |
| + | 10 |
| - | 11 |
| \* | 12 |
| / | 13 |
| % | 14 |
| < | 15 |
| <= | 16 |
| = | 17 |
| > | 18 |
| > | 19 |
| == | 20 |
| != | 21 |
| ++ | 22 |
| -- | 23 |
| if | 24 |
| else | 25 |
| for | 26 |
| while | 27 |
| print | 28 |
| break | 29 |
| continue | 30 |
| void | 31 |
| return | 32 |
| int | 33 |
| char | 34 |
| array | 35 |
| identifier | 0 |
| constant | 1 |