Lab 1b

Statement: Considering a small programming language (that we shall call mini-language), you have to write a scanner (lexical analyser)

Task 1: Minilanguage Specification

Deliverables:

1. Lexic.txt (file containing mini language lexic description; see example)
2. token.in (containing the list of all tokens corresponding to the minilanguage)
3. Syntax.in - the syntactical rules of the language

Task 2: Review the mini language specification of a colleague

The minilanguage can be a restricted form of a known programming language, and should contain the following:

- 2 simple data types and a user-defined type

- statements:

- assignment

- input/output

- conditional

- loop

- some conditions will be imposed on the way the identifiers and constants can be formed:

i) Identifiers: no more than 256 characters

ii) constants: corresponding to your types

Example: the minilanguage specification should include lexical and syntactical details:

Specification (file Lexic.txt)

Alphabet:

a. Upper (A-Z) and lower case letters (a-z) of the English alphabet

b. Underline character '_';

c. Decimal digits (0-9);

1. Lexic:

a.Special symbols, representing:

- operators + - * / := < <= = >=

- separators [ ] { } : ; space

- reserved words:

array char const do else if int of program read

then var while write

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"

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

c.constants

1.integer - rule:

noconst:="+"no|"-"no|no

no:=digit{no}

2.character

character:='letter'|'digit'

3.string

constchar:="string"

string:=char{string}

char:=letter|digit

2. Syntax:

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

Sintactical rules: (file Syntax.in)

program ::= "VAR" decllist ";" cmpdstmt "."

decllist ::= declaration | declaration ";" decllist

declaration ::= IDENTIFIER ":" type

type1 ::= "BOOLEAN" | "CHAR" | "INTEGER" | "REAL"

arraydecl ::= "ARRAY" "[" nr "]" "OF" type1

type ::= type1|arraydecl

cmpdstmt ::= "BEGIN" stmtlist "END"

stmtlist ::= stmt | stmt ";" stmtlist

stmt ::= simplstmt | structstmt

simplstmt ::= assignstmt | iostmt

assignstmt ::= IDENTIFIER ":=" expression

expression ::= expression "+" term | term

term ::= term "*" factor | factor

factor ::= "(" expression ")" | IDENTIFIER

iostmt ::= "READ" | "WRITE" "(" IDENTIFIER ")"

structstmt ::= cmpdstmt | ifstmt | whilestmt

ifstmt ::= "IF" condition "THEN" stmt ["ELSE" stmt]

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whilestmt ::= "WHILE" condition "DO" stmt

condition ::= expression RELATION expression

RELATION ::= "<" | "<=" | "=" | "<>" | ">=" | ">"
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