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CIMPLE COMPILER

About Cimple

Cimple is a simple educational programming language based on C.

This language supports popular programming commands and functions like:

While	**If - Else**
Switchcase	**Return**
Print	**Input**
Call	

.
Also includes the new commands :
Forcase and **Incase** .

Cimple also supports functions and procedures, pass by reference and by value ,recursive calls and declaration of nested functions(Not supported by C).

However Cimple does not support basic programming tools like:
For loops
Strings
Real numbers
Arrays.
These omissions have been made for educational purposes in order to simplify the procedure construction of the compiler.

Lastly, The compiler will produce, as the final language, the assembly language of the MIPS processor.Using a MIPS emulator we will be able to execute the assembly code generated by the compiler.

Cimple files end in .ci

The Cimple alphabet

• Letters(A,...,Z and a,...,z)
• Digits (0,...,9)
• Arithmetic operations (+, -, *, /)
• Relational operators (<, >, =, <=, >=, <>)
• Assignment symbol(:=)
• Separators (;, “,” , :)

• Grouping symbols([,], (,) , { , })
• Program termination symbol (.)
• Comment separation(#)

The priority of the operators from the largest to the smallest is:

• *, /
• +, -
• =, <, >, <>, <=, >=
• not
• and
• or

The symbols [,] are used in logical representations such as the symbols (,) in numbers representations.
The numbers take values from –(2^32 − 1)t o (2^32 − 1).
Language identifiers (ID) are strings consisting of letters and letters , but starting with a letter.
ID with more than 30 characters are considered incorrect.
???den eipame oti den exoume Strings??????
The white characters (tab, space, return) are ignored.

RESERVED WORDS :

program	**print**
if	**while**
switchcase	**incase**
not	**or**
function	**call**
input	**case default**
declare	**return in**
else	**inout**
forcase	**procedure**
and	

Program format

program ID
    Declarations
    Subprograms
    Statements

- **DECLARATIONS**

declare ID (,ID)* ;
We are allowed to have more of one consecutive uses of declare

- **SUBPROGRAMS**

```
function ID ( formalPars )
{
        declarations
        subprograms
        statements
}

procedure ID ( formalPars )
{
        declarations
        subprograms
        statements
}
```

FormalPars is the list of standard parameters

By reference in
By value inout

- **STATEMENTS**

- **Assignment**

  ID := expression
  Used to assign the value of a variable or a constant, or an expression in a variable.

- **If - Else**

  ```
  if ( condition )
          statements 1
  [else
          statements 2 ]
  ```

- **while**

  ```
  while ( condition )
          statements
  ```

- **switchcase**

  The switchcase repetition structure checks the conditions after the cases.
  Just one of these are found to be true, then the statements1 are executed (following the contion).
  The programm then continues **out** of switchcase.
  If none of the cases apply, then the control goes to default and statements2 are executed.
  Then the programm continues .

  switchcase
  (case (condition) statements 1) *
  default statements 2

- **forcase**

  The forcase repetition structure checks the conditions after the cases.
  Just one of these are found to be true, then the statements1 are executed (following the contion).
  The programm then goes to the **beginning** of forcase.
  If none of the cases apply, then the control goes to default and statements2 are executed.
  Then the programm continues .

  forcase
  (case (condition) statements 1) *
  default statements 2

- **Incase**

  The incase repetition structure checks the conditions after the cases, examining themin order.
  For each for which the corresponding condition applies, the statements are executed(following the condition).
  All conditions will be examined in turn and will be executed all statements whose conditions apply.
  After all the cases are examined, the control goes outside the incase structure if none of the statements have been executed, or goes to the beginning of the incase, if even one of the statements has been executed.

  incase
  (case (condition) statements 1) *
  default statements 2

- **return**

  return (expression)

- **print**

  print (expression)

- **input**

  input (ID)

  Asks the user to enter a value through the keyboard. The input value will be given to the variable ID.

- **call**

  call funtionName (actualParameters)

Scope rules

Global are the variables declared in the main program and are accessible to all..
Local are the variables declared in a function or process and are only accessible through that function or process.