Laboratorio 12

Objetivo

Desarrollar un intérprete para una gramática con verificación de tipos (typechecker).

Programa

Se tiene implementado la siguiente gramática,

- Program ::= Body
- Body ::= VarDecList StmtList
- VarDecList ::= (VarDec)*
- VarDec ::= “var” Type VarList **;**
- Type ::= id
- VarList :: id (“,” id)*
- StmtList ::= Stmt **(;** Stmt **)***
- Stmt ::= **id =** CExp |
  - **print (** CExp **) |**
  - **if** CExp **then** Body [**else** Body] **endif**
  - **while** CExp **do** Body **endwhile**
- CExp ::= Exp [(**<**|**<=**|**==**) Exp]
- Exp ::= Term ((**+** | **-**) Term)*
- Term ::= Factor ((*****|**/**) Factor)*
- Factor ::= **id** | **Num | Bool** | **(** Exp **)** | **ifexp (**CExp **,** CExp **,** CExp **)**
- Bool **::= “true” | “false”**

Con la clase ImpValue para manejar los tipos.

```
class ImpValue {
public:
  ImpValue(string tipo,int valor,
bool bol){
    type = tipo;
    int_value = valor;
    bool_value = bol;
  };
  ImpValue(){
  };
  ~ImpValue(){};
  string type;
  int int_value;
  bool bool_value;
};
```

Problema 1
Implementar la gramática:

- Program ::= Body
- Body ::= VarDecList StmtList
- VarDecList ::= (VarDec)*
- VarDec ::= “var” Type VarList **;**
- Type ::= id
- VarList :: id (“,” id)*
- StmtList ::= Stmt **(;** Stmt **)***
- Stmt ::= **id =** AExp |
  - **print (** AExp **)**
  - **if** AExp **then** Body [**else** Body] **endif**
  - **while** AExp **do** Body **endwhile**
  - **for id in range(**AExp**,**Axp**,**AExp**)** Body **endfor**
- AExp ::= BExp [(**and**|**or**) BExp]
- BExp ::= CExp| **not** CExp
- CExp ::= Exp [(**<**|**<=**|**==**) Exp].
- Exp ::= Term ((**+** | **-**) Term)*
- Term ::= Factor ((*****|**/**) Factor)*
- Factor ::= **id** | **Num** | **Bool** | **(** Exp **)** | **ifexp (**CExp **,** CExp **,** CExp **)**
- Bool **::= “true” | “false”**

Se debe implementar el EVALVisitor y TypeVisitor

Verificar enviar mensajes de error en los siguientes casos

4 and 5	unsupported operand type
4 + true	unsupported operand type
while 5 do ….	Boolean is expected in while
not 5	unsupported operand type
var string x,y	type error