Assignment No.8 (group B)

* **Title**:- Yacc program to validate variable declarations.

* **Problem statement**:-

Write a program using YACC specifications to implement syntax analysis phase of compiler to validate type and syntax of variable declaration in java.

* **Learning objective**:-

*Analyze source code for variables.
*Identify datatype and syntax of variable.

* **Learning outcome**:-

Match variables and identify datatypes

* **Theory**:-

Lex recognizes regular expressions, whereas YACC recognizer entire gramme Lex divides the input stream into tokens while YACC uses these tokens and groups them together easily.

Syntax of Yacc file:-

The syntax of lex and yacc file are same

```
%{
   declaration section
%}
   rules section
%%
   user defined functions.
```

Declaration sections:-

Here the definition section is same as that of lex, where we can define all tokens and include header files the declaration section is used to define the symbols used to define the target language and their relationship with other.

In particular, much of the additional information required to solve ambiguous in the context free grammar for the target language is provided free here.

Grammar rules in Yacc:-

The rules section defines the context free grammar to be accepted by the function Yacc generates and associates with those rules C-language actions and additional precedence information. The grammar is as follows.

The rules section is comprised of A;body;
A symbol represent a non-terminal name and Body represents a sequence of zero and more names, literals & semantic actions that can then be followed by options that can then be followed by precedence rules. only the names and literals participate in the formation of the grammar. The semantic actions and precedence rules are used in other ways. The colon and the semicolon are Yacc implementation.

Program section:-
The program section can include the definition of the lexical analyzer yylex().
for example, those used in the actions specified in the grammar rules. if the application contains any macro definitions and declarations intended to apply to the code in the semantic actions. it shall place them within "%{ ... %}" in the declaration section.

Interface to lexical analyzer:-

The yylex() functionis an integer-value functions that returns a token number representing the kind of token read. If there is a value associated with the tokens returned by yylex().

Test Case:-

```
yacc -d syntax.y
lex syntax.l
./a.out int a,b,c=10;
```

int => Datatype
a => ID
, => Comma
b => ID
, => Comma
c => ID
= => Assignment operator
10 => INT Value.
; => semicolon.

Valid int declaration

* float f=10;

output:- Invalid declaration.

* **Conclusion:-** Thus, successfully implemented yacc program to syntactically analyze declaration of Variable and raising error an incorrect declaration.