**PRACTICAL # 10**

**OBJECT:**

Implementation for declaration and initialization statements CFG.

**THEORY:**

Implementation of declaration and initialization statements CFG is straightforward based on the CFG. The non-terminals in the CFG are implemented as functions. The terminals are simply mapped to if conditions to match required token.

**Program:**

This program implements the CFG for declaration and initialization statements.

*using System;*

*class SyntaxAnalyser{*

*/implements cfg for declaration statement*

*//<Dec\_Stat> -> DT ID <Dec\_statP>*

*public static void Dec\_stat(List<Token> tokens, ref int i) {*

*if (tokens[i].TokenClass == "DT") {*

*i++;*

*if (tokens[i].TokenClass == "ID")*

*{*

*i++;*

*init\_stat(tokens, ref i);*

*Dec\_statP(tokens, ref i);*

*}*

*else {*

*Console.WriteLine("Incorrect syntax at line " + tokens[i].LineNum);*

*}*

*}*

*}*

*//<Dec\_statP> -> , ID <Dec\_statP>*

*//<Dec\_statP> -> ;*

*public static void Dec\_statP(List<Token> tokens, ref int i)*

*{*

*if (tokens[i].TokenClass == ",")*

*{*

*i++;*

*if (tokens[i].TokenClass == "ID")*

*{*

*i++;*

*init\_stat(tokens, ref i);*

*Dec\_statP(tokens, ref i);*

*}*

*else*

*{*

*Console.WriteLine("Incorrect syntax at line " + tokens[i].LineNum*

*+ ", Identifier missing");*

*return;*

*}*

*}*

*else if (tokens[i].TokenClass == ";")*

*{*

*Console.WriteLine("declaration stat parsed successfully!");*

*}*

*else*

*{*

*Console.WriteLine("Incorrect syntax at line " +*

*tokens[i].LineNum + " Semicolon missing");*

*return;*

*}*

*}*

*public static void init\_stat(List<Token> tokens, ref int i) {*

*if (tokens[i].TokenClass == "=")*

*{*

*i++;*

*init\_statP(tokens, ref i);*

*}*

*else {*

*//in case of token other than =*

*return;*

*}*

*}*

*public static void init\_statP(List<Token> tokens, ref int i)*

*{*

*if(tokens[i].TokenClass == "ID"){*

*i++;*

*init\_stat(tokens, ref i);*

*}*

*else if (tokens[i].TokenClass == "int\_const")*

*{*

*i++;*

*return;*

*}*

*else {*

*Console.WriteLine("incorrect syntax, ID or constant missing at line number: {0} ", tokens[i].LineNum );*

*return;*

*}*

*}*

*}*

Execute the program to observe the output.

**ACTIVITIES**

**Activity 1**

Implement the declaration and initialization statements CFG of your own language.

**REVIEW QUESTIONS**

1. How many variables can be declared in a single statement?
2. How do you define both uninitialized and initialized variables in a single statement?