**PRACTICAL # 06**

**OBJECT:**

DFA implementation for identifiers and keywords recognition.

**THEORY:**

Keywords are specific reserved words in a programming language with special meaning. An identifier can be a keyword if it is included in the list of reserved keywords list of a language.

**Program:**

This program recognizes identifiers with identifier DFA. Next it checks whether the identifier is in the keywords list. If it is in the list, it is a keyword, otherwise it is an identifier.

*//Token class*

*class Token*

*{*

*private string tokenClass;*

*private string lexeme;*

*private int lineNum;*

*public Token( string cls, string lexm ) {*

*this.tokenClass = cls;*

*this.lexeme = lexm;*

*}*

*public Token( string cls, string lexm, int lineNum ) {*

*this.tokenClass = cls;*

*this.lexeme = lexm;*

*this.lineNum = lineNum;*

*}*

*public string TokenClass {*

*get {*

*return this.tokenClass;*

*}*

*}*

*public string Lexeme {*

*get {*

*return this.lexeme;*

*}*

*}*

*public int LineNum*

*{*

*get*

*{*

*return this.lineNum;*

*}*

*}*

*public string toString() {*

*return "("+ tokenClass + ", " + lexeme + ", " + lineNum + ")" ;*

*}*

*}*

*using System;*

*class LexicalAnalysis {*

*private static string[] keywords =*

*{ //"char", "int", "float", "double",*

*"for", "do", "while", "if", "else" };*

*private static string[] dataTypes =*

*{ "char", "int", "float", "double" };*

*public static Token recognizeID(string src, ref int i, int lineNum) {*

*char peek = src[i];*

*string identifier = "";*

*if (peek >= 'a' && peek <= 'z'*

*||*

*peek >= 'A' && peek <= 'Z') {*

*do{*

*identifier += peek;*

*i++;*

*peek = src[i];*

*} while (peek >= 'a' && peek <= 'z'*

*||*

*peek >= 'A' && peek <= 'Z'*

*||*

*peek >= '0' && peek <= '9');*

*i--;*

*}*

*Token t;*

*if (keywords.Contains(identifier) == true)*

*{*

*t = new Token(identifier, identifier, lineNum);*

*}else if(dataTypes.Contains(identifier)){*

*t = new Token("DT", identifier);*

*}*

*else {*

*t = new Token("ID", identifier, lineNum);*

*}*

*}*

Execute the program to observe the output.

**ACTIVITIES**

**Activity 1**

Write a program in C# that recognizes and outputs identifiers from the code “int 234=dsf, 43,54a;”.

**REVIEW QUESTIONS**

1. Is there any maximum length of identifiers ?
2. What are keywords?
3. How do you recognize keywords?