**Name: Brijesh Rohit**

**Admission no.: U19CS009**

**SYSTEM SOFTWARES - ASSIGNMENT -2**

**Write a C program to detect tokens.**

**Code=>**

|  |
| --- |
| **#include <stdio.h>**  **#include <string.h>**  **#include <stdbool.h>**  **#include <stdlib.h>**  **bool isDelimiter(char ch)**  **{**    **if (**  **(ch == ' ' || ch == '+' || ch == '-' || ch == '\*' ) ||**  **(ch == ',' || ch == ';' || ch == '>' || ch == '<' ) ||**  **(ch == '(' || ch == ')' || ch == '[' || ch == ']' ) ||**  **(ch == '}' || ch == '/' || ch == '=' || ch == '{' )**  **)**  **return true;**  **return false;**  **}**  **bool isOperator(char ch)**  **{**  **if (**  **(ch == '+' || ch == '-' || ch == '\*' || ch == '/') ||**  **(ch == '>' || ch == '<' || ch == '=')**  **)**  **return true;**  **return false;**  **}**  **bool validIdentifier(char \*str)**  **{**  **if (**  **str[0] == '0' || str[0] == '1' || str[0] == '2' ||**  **str[0] == '3' || str[0] == '4' || str[0] == '5' ||**  **str[0] == '6' || str[0] == '7' || str[0] == '8' ||**  **str[0] == '9' || isDelimiter(str[0]) == true**  **)**  **return false;**  **return true;**  **}**  **bool isKeyword(char \*str)**  **{**  **if (**  **!strcmp(str, "if") || !strcmp(str, "else") ||**  **!strcmp(str, "while") || !strcmp(str, "do") ||**  **!strcmp(str, "break") || !strcmp(str, "continue") ||**  **!strcmp(str, "int") || !strcmp(str,"double") ||**  **!strcmp(str, "float") || !strcmp(str, "return") ||**  **!strcmp(str, "char") || !strcmp(str, "case") ||**  **!strcmp(str, "char") || !strcmp(str, "sizeof") ||**  **!strcmp(str, "long") || !strcmp(str, "short") ||**  **!strcmp(str, "typedef") || !strcmp(str, "switch") ||**  **!strcmp(str, "unsigned") || !strcmp(str, "void") ||**  **!strcmp(str, "static") || !strcmp(str, "struct") ||**  **!strcmp(str, "goto")**  **)**  **return true;**  **return false;**  **}**  **bool isInteger(char \*str)**  **{**  **int len = strlen(str);**  **if (len == 0)**  **return false;**  **for (int i = 0; i < len; i++)**  **{**  **if (**  **str[i] != '0' && str[i] != '1' && str[i] != '2' &&**  **str[i] != '3' && str[i] != '4' && str[i] != '5' &&**  **str[i] != '6' && str[i] != '7' && str[i] != '8' &&**  **str[i] != '9' || (str[i] == '-' && i > 0)**  **)**  **return false;**  **}**  **return true;**  **}**  **bool isRealNumber(char \*str)**  **{**  **int len = strlen(str);**  **bool hasDecimal = false;**  **if (len == 0)**  **return false;**  **for (int i = 0; i < len; i++) {**  **if (**  **str[i] != '0' && str[i] != '1' && str[i] != '2' &&**  **str[i] != '3' && str[i] != '4' && str[i] != '5' &&**  **str[i] != '6' && str[i] != '7' && str[i] != '8' &&**  **str[i] != '9' && str[i] != '.' || (str[i] == '-' && i > 0)**  **)**  **return false;**  **if (str[i] == '.')**  **hasDecimal = true;**  **}**  **return (hasDecimal);**  **}**  **char \*subString(char \*str, int left, int right)**  **{**  **char \*subStr = (char \*)malloc(sizeof(char) \* (right - left + 2));**  **for (int i = left; i <= right; i++)**  **subStr[i - left] = str[i];**  **subStr[right - left + 1] = '\0';**  **return (subStr);**  **}**  **void findToken(char \*str)**  **{**  **int left = 0, right = 0;**  **int len = strlen(str);**  **while (right <= len && left <= right)**  **{**  **if (isDelimiter(str[right]) == false)**  **right++;**  **if (isDelimiter(str[right]) == true && left == right)**  **{**  **if (isOperator(str[right]) == true)**  **printf("'%c' IS AN OPERATOR\n", str[right]);**  **right++;**  **left = right;**  **}**  **else if (**  **isDelimiter(str[right]) == true && left != right ||**  **(right == len && left != right)**  **)**  **{**  **char \*subStr = subString(str, left, right - 1);**  **if (isKeyword(subStr))**  **printf("'%s' IS A KEYWORD\n", subStr);**  **else if (isInteger(subStr))**  **printf("'%s' IS AN INTEGER\n", subStr);**  **else if (isRealNumber(subStr))**  **printf("'%s' IS A REAL NUMBER\n", subStr);**  **else if (**  **validIdentifier(subStr) &&**  **isDelimiter(str[right - 1]) == false**  **)**  **printf("'%s' IS A VALID IDENTIFIER\n", subStr);**  **else if (**  **!validIdentifier(subStr) &&**  **!isDelimiter(str[right - 1])**  **)**  **printf("'%s' IS NOT A VALID IDENTIFIER\n", subStr);**  **left = right;**  **}**  **}**  **return;**  **}**  **int main()**  **{**  **char str[20] = "float = a\*b + c\*d";**  **printf("\nThe string is %s\n", str);**  **findToken(str);**  **printf("\n");**  **return 0;**  **}** |

**Output=>**

