**PRACTICAL-2**

**AIM: Write a C programme to categorise the given C language statement into identifier, keywords and operators.**

**CODE:**

#include <stdbool.h>

#include <stdio.h>

#include <string.h>

#include <stdlib.h>

bool isDelimiter(char ch) {

if (ch == '+' || ch == '-' || ch == '\*' ||

ch == '/' || ch == ',' || ch == ';' || ch == '>' ||

ch == '<' || ch == '=' || ch == '(' || ch == ')' ||

ch == '[' || ch == ']' || ch == '{' || ch == '}')

return (true);

else if(ch == ' ')

return (false);

else

return (false); }

bool isOperator(char ch) {

if (ch == '+' || ch == '-' || 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")

|| !strcmp(str, "printf"))

return (true);

return (false); }

bool isInteger(char\* str) {

int i, len = strlen(str);

if (len == 0)

return (false);

for (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 i, len = strlen(str);

bool hasDecimal = false;

if (len == 0)

return (false);

for (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) {

int i;

char\* subStr = (char\*)malloc(sizeof(char) \* (right - left + 2));

for (i = left; i <= right; i++)

subStr[i - left] = str[i];

subStr[right - left + 1] = '\0';

return (subStr); }

void parse(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) == true)

printf("'%s' Is A Keyword\n", subStr);

else if (isInteger(subStr) == true)

printf("'%s' Is An Integer\n", subStr);

else if (isRealNumber(subStr) == true)

printf("'%s' Is A Real Number\n", subStr);

else if (validIdentifier(subStr) == true

&& isDelimiter(str[right - 1]) == false)

printf("'%s' Is An Identifier\n", subStr);

else if (validIdentifier(subStr) == false

&& isDelimiter(str[right - 1]) == false)

printf("'%s' Is Not A Valid Identifier\n", subStr);

left = right; } }

return; }

int main()

{ char str[100];

printf("Enter any statement:");

gets(str);

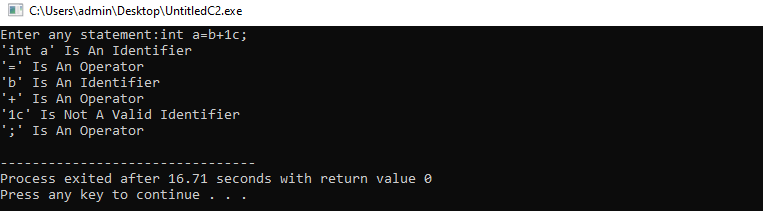
parse(str);

return (0);

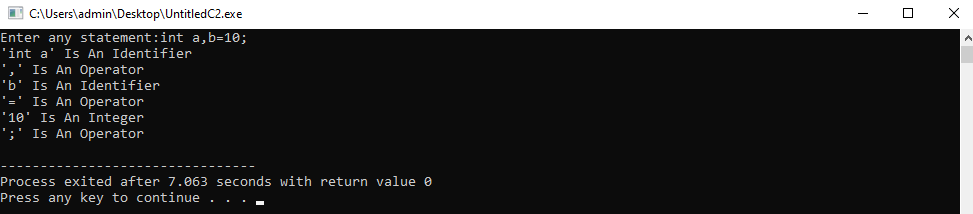
}

**OUTPUT:**

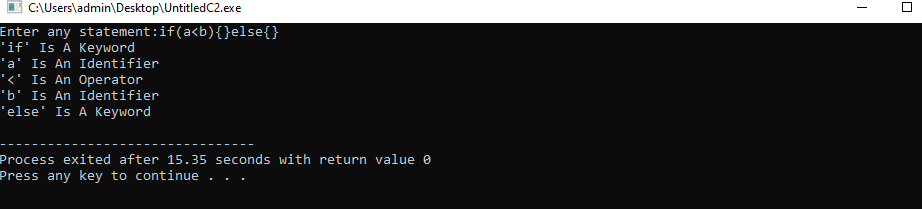
**Test-Case 1:**



**Test-Case 2:**



**Test-Case 3:**



**Test-Case 4:**

