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Admission number: U19CS009

SYSTEM SOFTWARES

ASSIGNMENT 1

1) Write a C program to test whether a given identifier is valid or not.

Code:

```c
//u19cs009
/*Brijesh Rohit*/

#include <stdbool.h>
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <ctype.h>

char keywords[32][10] = {
    "auto","case","char","continue","default","do","else","double",
    "const","enum","extern","float","for","goto","if","int","while",
    "break","long","register","return","short","signed","sizeof",
    "static","struct","switch","typedef","union","unsigned","void",
    "volatile"
};

bool isKeyword(char* str)
{
    for(int i = 0 ; i < 32 ; i++)
    {
        if(!strcmp(str,keywords[i]))
            return true;
    }
    return false;
}

bool isIdentifier(char* str)
{
    if (isKeyword(str))
        return false;

    if (!isalpha(str[0]) && str[0] != '_')
        return false;

    for (int i = 1; i < strlen(str); i++)
    {
        if (!isalnum(str[i]))
            return false;
    }

    return true;
}
```

```c
int main()
{
    char str[100];
    printf("Enter the string : ");
    scanf("%s", str);
    if (isIdentifier(str))
    {
        printf("Given string is a Valid Identifier!!!\n");
    }
    else {
        printf("Given string is an Invalid identifier!!!\n");
    }
    return 0;
}
```

Output:

```
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ g++ iden
tifier.c
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : brij
Given string is a Valid Identifier!!!
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : _birju
Given string is a Valid Identifier!!!
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : birju1
Given string is a Valid Identifier!!!
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : 1birju
Given string is an Invalid identifier!!!
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : _123
Given string is a Valid Identifier!!!
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : _1+2
Given string is an Invalid identifier!!!
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : int
Given string is an Invalid identifier!!!
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : float
Given string is an Invalid identifier!!!
```

2) Write a C program to identify whether a given line is a comment or not.

Code:

```c
#include <stdbool.h>
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <ctype.h>
void parseString(char *str)
{
    int i = 0, j = 0;
    while (str[i] == ' ')
        i++;
    while (i < strlen(str))
    {
        str[j] = str[i];
        i++;
        j++;
    }
    str[j] = '\0';
    j = strlen(str) - 1;
    while (str[j] == ' ')
        j--;
    str[j + 1] = '\0';
}
bool singlelinecomment(char* str, int s)
{
    while (str[s] == ' ') s++;
    int l = strlen(str) - s;
    if (l < 2) return false;
    if (str[s] != '/' || str[s + 1] != '/') return false;
    return true;
}
bool multilinecomment(char* str, int s)
{
    while (str[s] == ' ') s++;
    int l = strlen(str) - s;
    if (l < 4) return false;
    if (str[s] != '/' || str[s + 1] != '*') return false;
    int end = -1;
    for (int i = s + 2; i < strlen(str) - 1; i++)
    {
        if (str[i] == '*' && str[i + 1] == '/')
        {
            end = i + 1;
            break;
        }
    }
    if (end == -1) return false;
    if (end != strlen(str) - 1) return singlelinecomment(str, end + 1) ||
multilinecomment(str, end + 1);
    return true;
}
```

```c
int main()
{
    char string[100];
    printf("Enter the string : ");
    scanf("%[^\n]s", string);
    parseString(string);
    if (singlelinecomment(string, 0))
        printf("String is single line comment!!!\n");
    else if (multilinecomment(string, 0))
        printf("String is multiline comment!!!\n");
    else
        printf("String is not a comment!!!\n");
    return 0;
}
```

Output:

```
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ g++ comm
ent.c
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : //
String is single line comment!!!
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : // birju rocks
String is single line comment!!!
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : /**/
String is multiline comment!!!
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : /* birju rocks*/
String is multiline comment!!!
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string :              //                        //
String is single line comment!!!
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : /*              birju
String is not a comment!!!
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : /*              birju           */
String is multiline comment!!!
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : /**/ //
String is multiline comment!!!
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : // /**/
String is single line comment!!!
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : /*  ////**/  */*/
String is not a comment!!!
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : //            /* ////*/****/**//    */*/
String is single line comment!!!
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : birju // /**/
String is not a comment!!!
brijesh@brijesh-GF75-Thin-9SCSR:~/sem6/system software/ss-assign03$ ./a.out
Enter the string : birju /* ///////***/**/
String is not a comment!!!
```