CS266

ASSIGNMENT 1

NAME:

ARCHIT AGRAWAL

ROLL NO. :

202051213

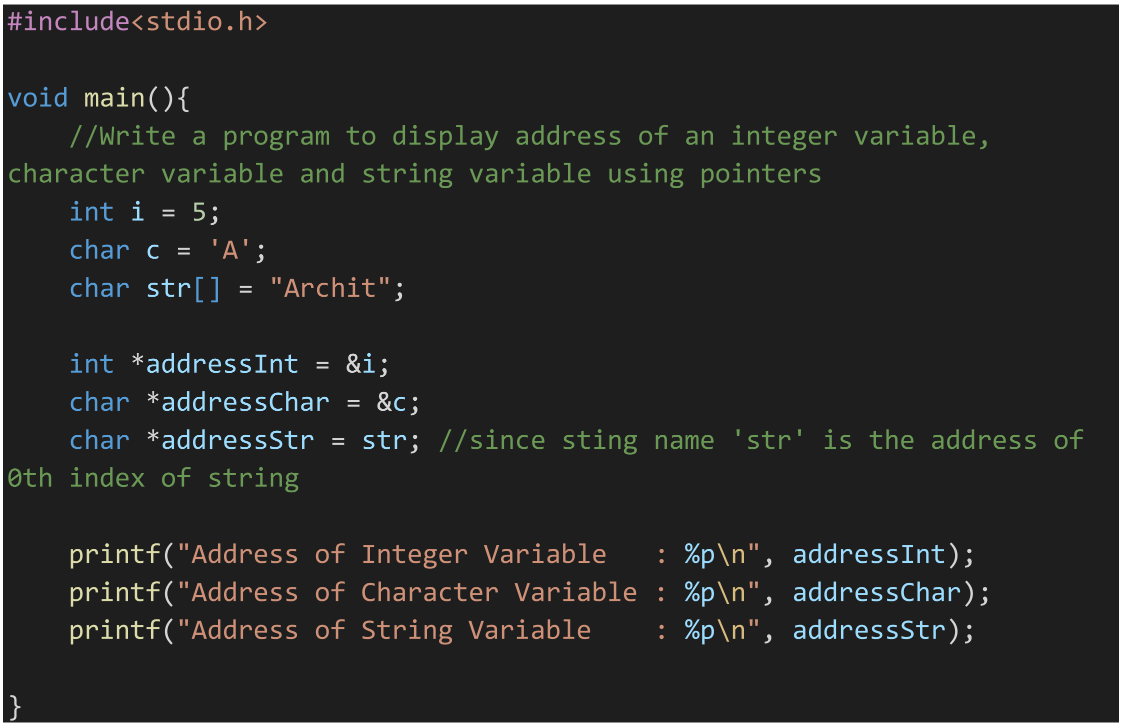
SECTION:

2

Based on Pointers

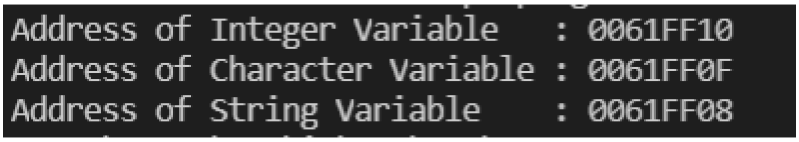
1. Write a program to display address of an integer variable, character variable and string variable using pointer.

Code



```
#include<stdio.h>

void main(){
    //Write a program to display address of an integer variable,
character variable and string variable using pointers
    int i = 5;
    char c = 'A';
    char str[] = "Archit";

    int *addressInt = &i;
    char *addressChar = &c;
    char *addressStr = str; //since sting name 'str' is the address of
0th index of string

    printf("Address of Integer Variable   : %p\n", addressInt);
    printf("Address of Character Variable : %p\n", addressChar);
    printf("Address of String Variable    : %p\n", addressStr);

}
```

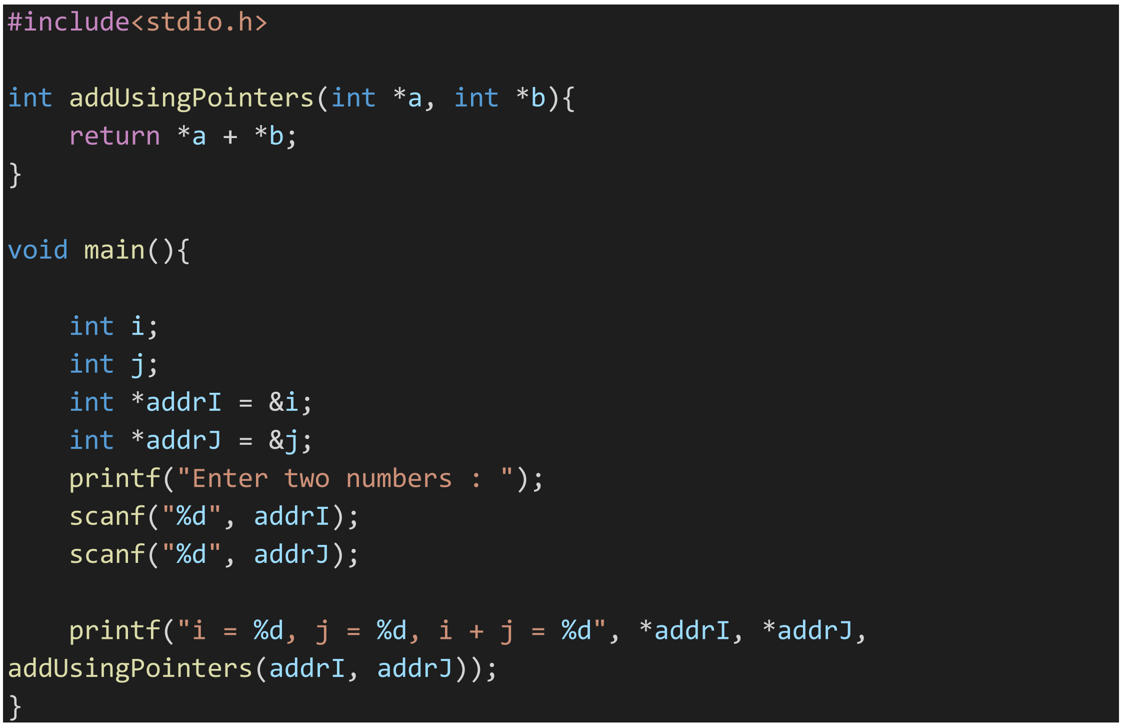
Output



```
Address of Integer Variable   : 0061FF10
Address of Character Variable : 0061FF0F
Address of String Variable    : 0061FF08
```

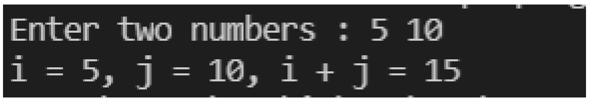
2. Write a program in C to add two numbers using pointers.

Code

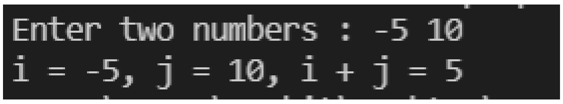


```c
#include<stdio.h>

int addUsingPointers(int *a, int *b){
    return *a + *b;
}

void main(){

    int i;
    int j;
    int *addrI = &i;
    int *addrJ = &j;
    printf("Enter two numbers : ");
    scanf("%d", addrI);
    scanf("%d", addrJ);

    printf("i = %d, j = %d, i + j = %d", *addrI, *addrJ,
addUsingPointers(addrI, addrJ));
}
```

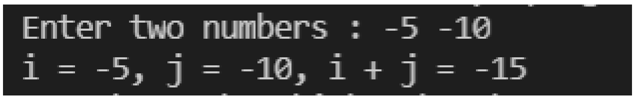
Output



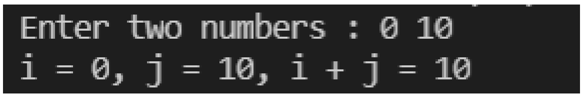
```
Enter two numbers : 5 10
i = 5, j = 10, i + j = 15
```



```
Enter two numbers : -5 10
i = -5, j = 10, i + j = 5
```



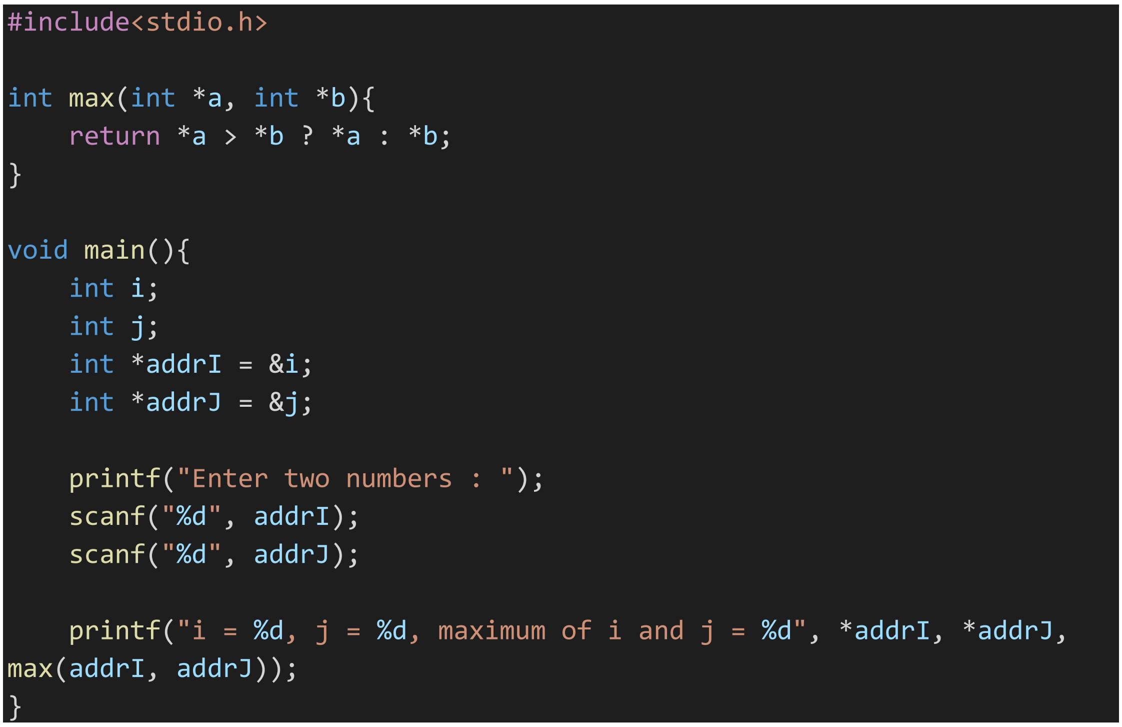
```
Enter two numbers : -5 -10
i = -5, j = -10, i + j = -15
```



```
Enter two numbers : 0 10
i = 0, j = 10, i + j = 10
```

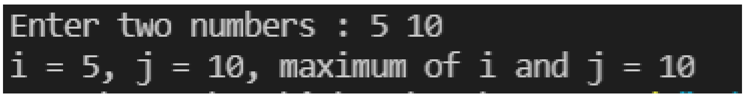
3. Write a program in C to find the maximum number between two numbers using a pointer.

Code

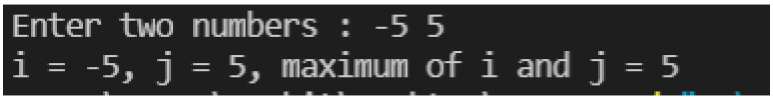


```c
#include<stdio.h>

int max(int *a, int *b){
    return *a > *b ? *a : *b;
}

void main(){
    int i;
    int j;
    int *addrI = &i;
    int *addrJ = &j;

    printf("Enter two numbers : ");
    scanf("%d", addrI);
    scanf("%d", addrJ);

    printf("i = %d, j = %d, maximum of i and j = %d", *addrI, *addrJ,
max(addrI, addrJ));
}
```

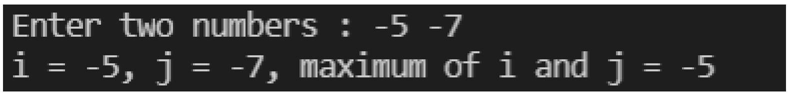
Output



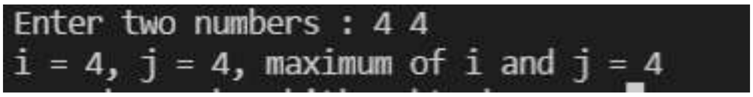
```
Enter two numbers : 5 10
i = 5, j = 10, maximum of i and j = 10
```



```
Enter two numbers : -5 5
i = -5, j = 5, maximum of i and j = 5
```



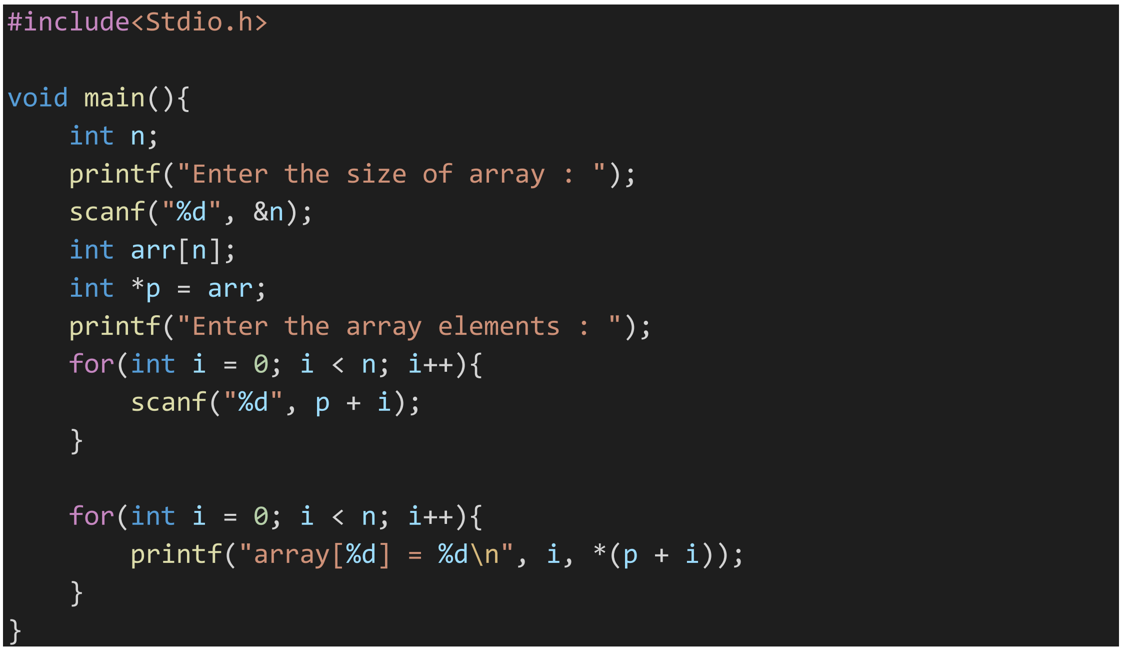
```
Enter two numbers : -5 -7
i = -5, j = -7, maximum of i and j = -5
```



```
Enter two numbers : 4 4
i = 4, j = 4, maximum of i and j = 4
```

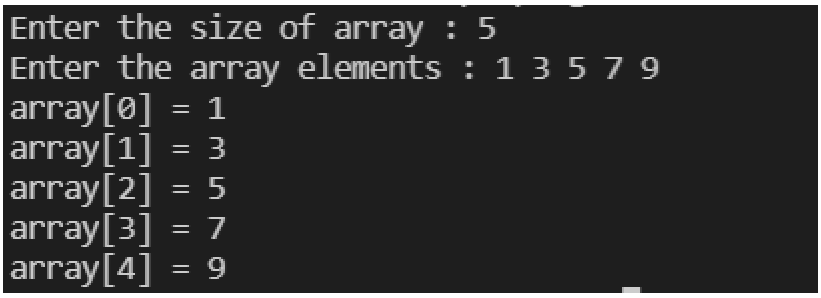
4. Write a program in C to store n elements in an array and print the elements using pointer.

Code

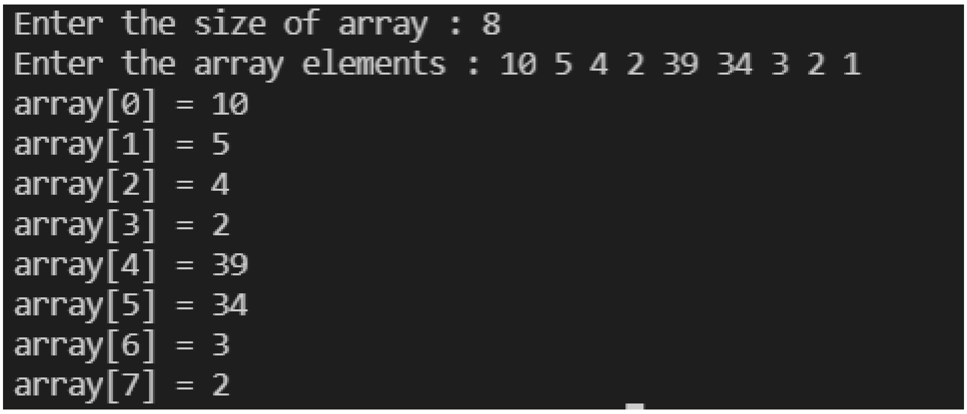


```c
#include<Stdio.h>

void main(){
    int n;
    printf("Enter the size of array : ");
    scanf("%d", &n);
    int arr[n];
    int *p = arr;
    printf("Enter the array elements : ");
    for(int i = 0; i < n; i++){
        scanf("%d", p + i);
    }

    for(int i = 0; i < n; i++){
        printf("array[%d] = %d\n", i, *(p + i));
    }
}
```

Output



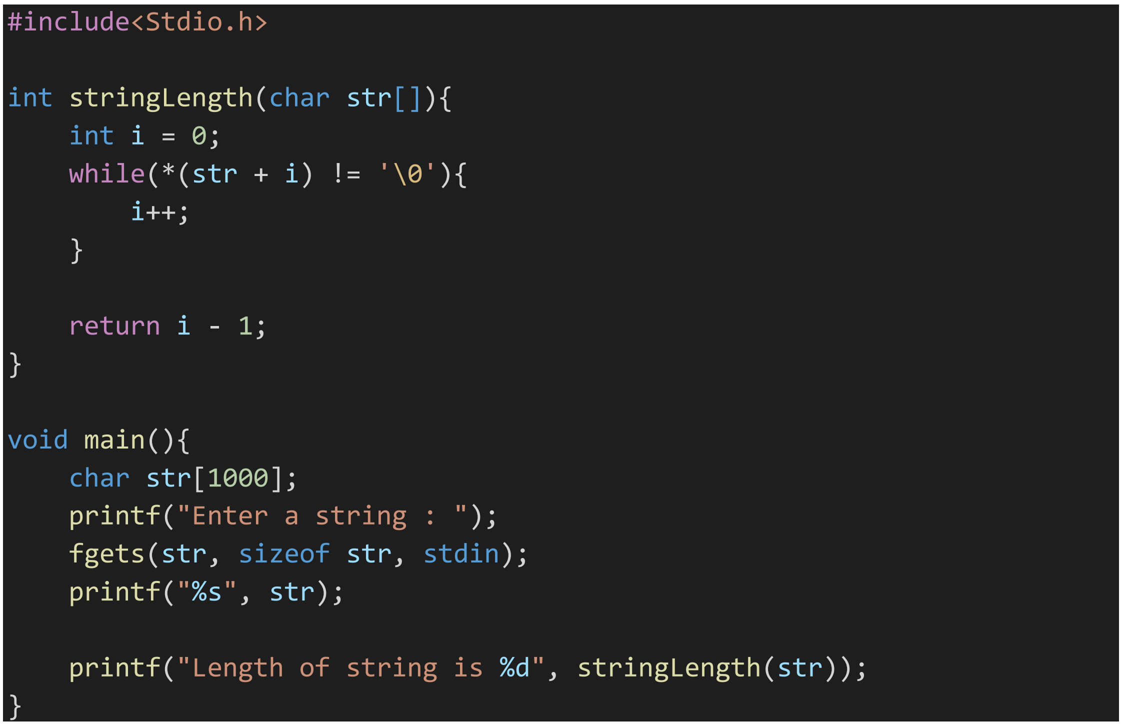
```
Enter the size of array : 5
Enter the array elements : 1 3 5 7 9
array[0] = 1
array[1] = 3
array[2] = 5
array[3] = 7
array[4] = 9
```



```
Enter the size of array : 8
Enter the array elements : 10 5 4 2 39 34 3 2 1
array[0] = 10
array[1] = 5
array[2] = 4
array[3] = 2
array[4] = 39
array[5] = 34
array[6] = 3
array[7] = 2
```

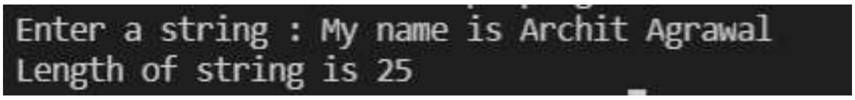
5. Write a program in C to Calculate the length of the string using a pointer.

Code

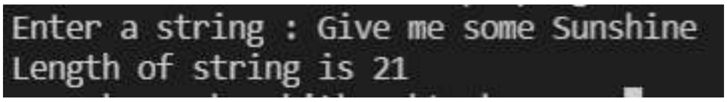


```c
#include<Stdio.h>

int stringLength(char str[]){
    int i = 0;
    while(*(str + i) != '\0'){
        i++;
    }

    return i - 1;
}

void main(){
    char str[1000];
    printf("Enter a string : ");
    fgets(str, sizeof str, stdin);
    printf("%s", str);

    printf("Length of string is %d", stringLength(str));
}
```

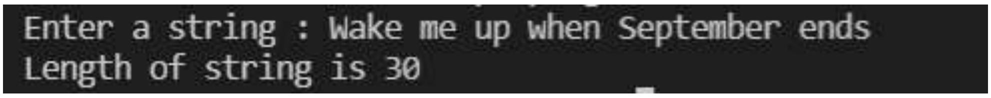
Output



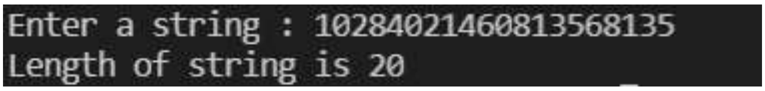
```
Enter a string : My name is Archit Agrawal
Length of string is 25
```



```
Enter a string : Give me some Sunshine
Length of string is 21
```



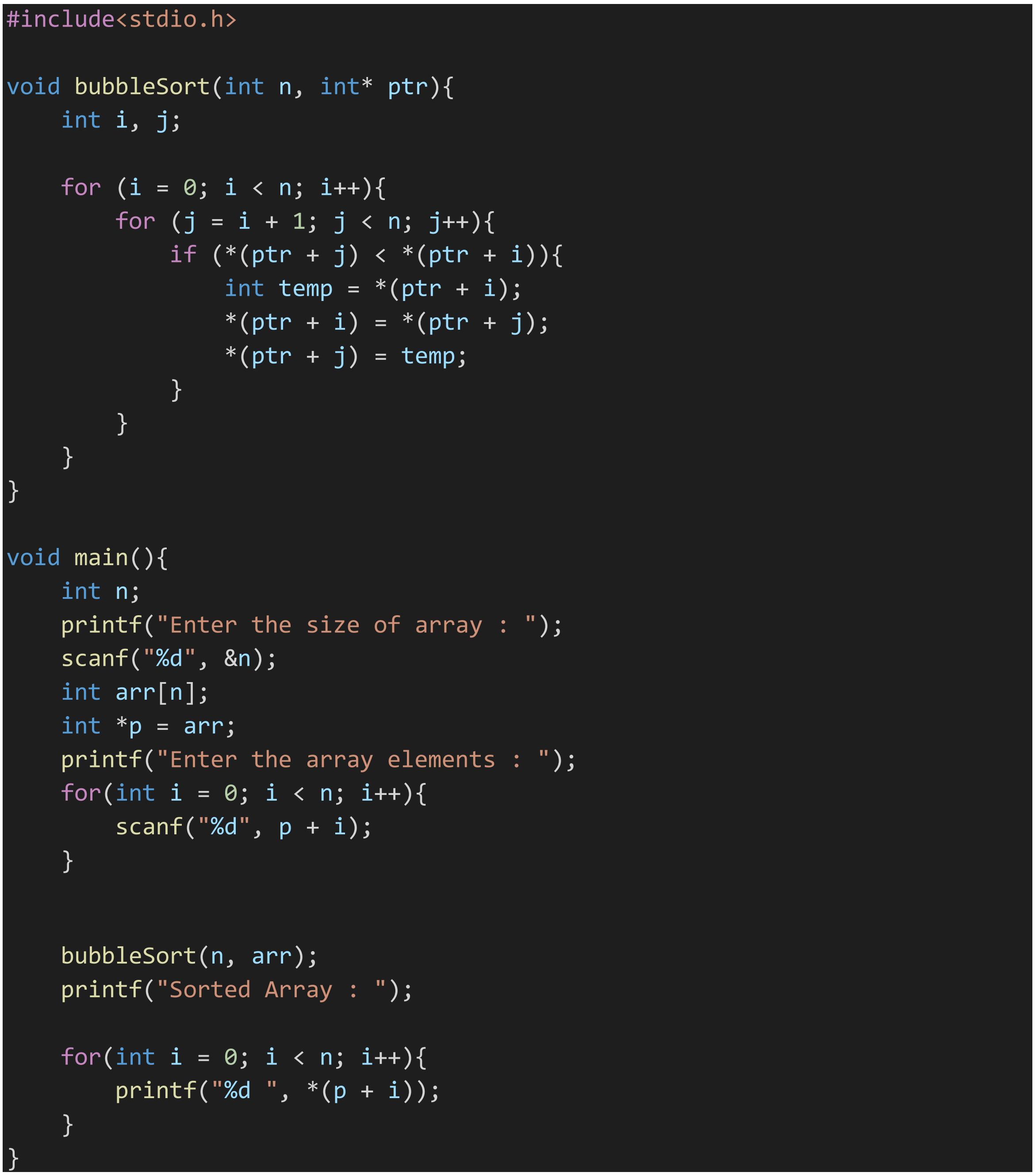
```
Enter a string : Wake me up when September ends
Length of string is 30
```



```
Enter a string : 10284021460813568135
Length of string is 20
```

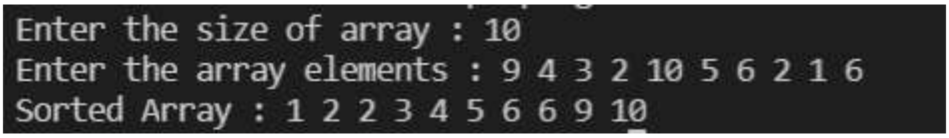
6. Write a program in C to sort an array using Pointer.

Code



```c
#include<stdio.h>

void bubbleSort(int n, int* ptr){
    int i, j;

    for (i = 0; i < n; i++){
        for (j = i + 1; j < n; j++){
            if (*(ptr + j) < *(ptr + i)){
                int temp = *(ptr + i);
                *(ptr + i) = *(ptr + j);
                *(ptr + j) = temp;
            }
        }
    }
}

void main(){
    int n;
    printf("Enter the size of array : ");
    scanf("%d", &n);
    int arr[n];
    int *p = arr;
    printf("Enter the array elements : ");
    for(int i = 0; i < n; i++){
        scanf("%d", p + i);
    }


    bubbleSort(n, arr);
    printf("Sorted Array : ");

    for(int i = 0; i < n; i++){
        printf("%d ", *(p + i));
    }
}
```

Output

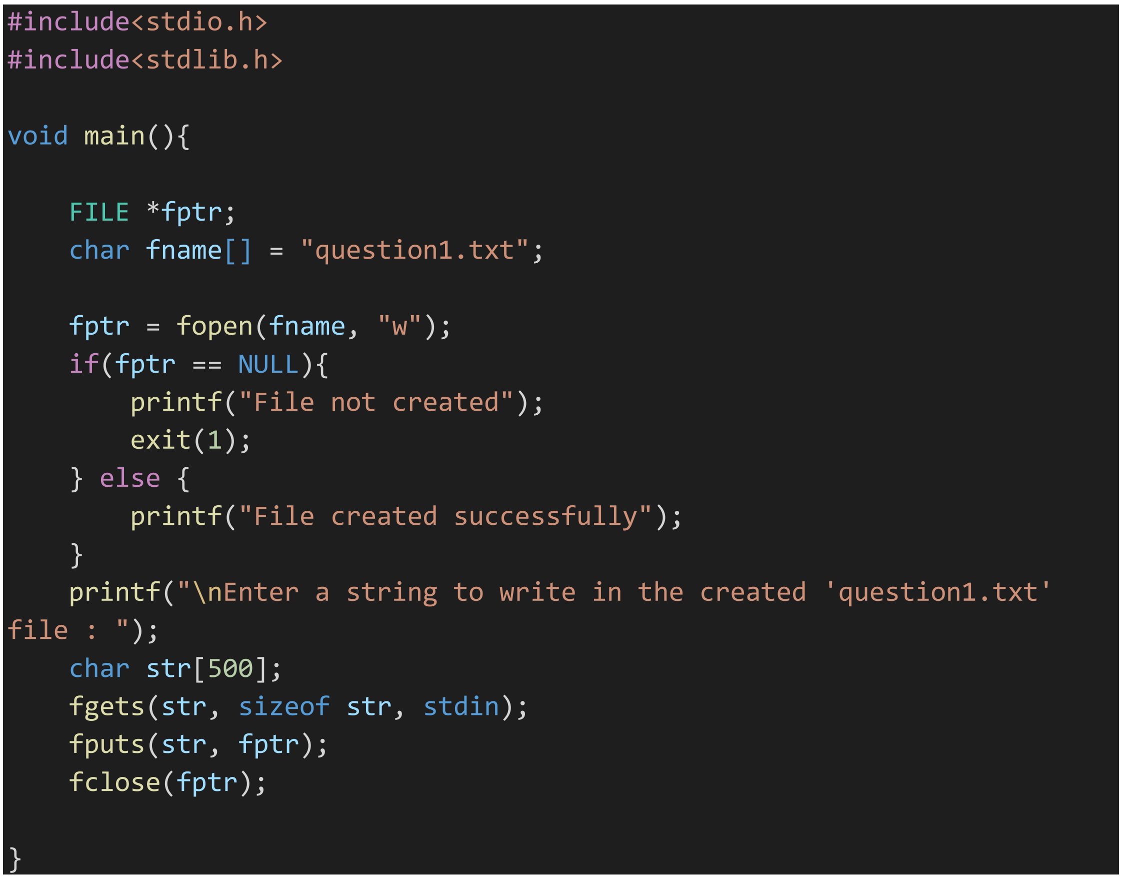


```
Enter the size of array : 10
Enter the array elements : 9 4 3 2 10 5 6 2 1 6
Sorted Array : 1 2 2 3 4 5 6 6 9 10
```

Based on File Handling

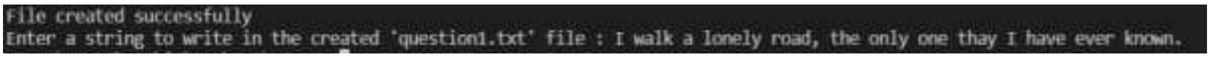
1. Write a program in C to create and store information in a text file.

Code

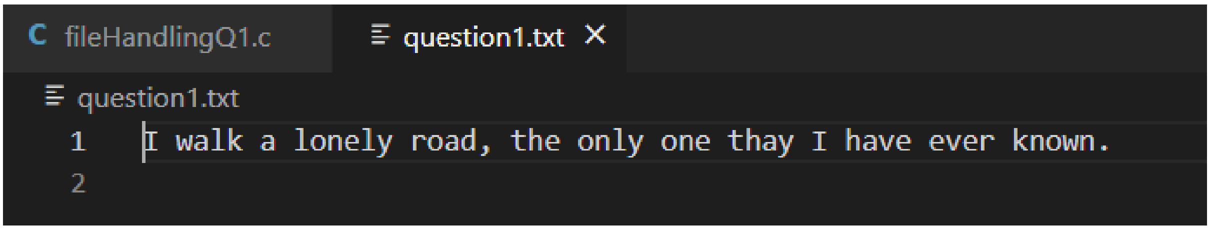


```c
#include<stdio.h>
#include<stdlib.h>

void main(){

    FILE *fptr;
    char fname[] = "question1.txt";

    fptr = fopen(fname, "w");
    if(fptr == NULL){
        printf("File not created");
        exit(1);
    } else {
        printf("File created successfully");
    }
    printf("\nEnter a string to write in the created 'question1.txt' 
file : ");
    char str[500];
    fgets(str, sizeof str, stdin);
    fputs(str, fptr);
    fclose(fptr);

}
```

Output



```
File created successfully
Enter a string to write in the created 'question1.txt' file : I walk a lonely road, the only one thay I have ever known.
```



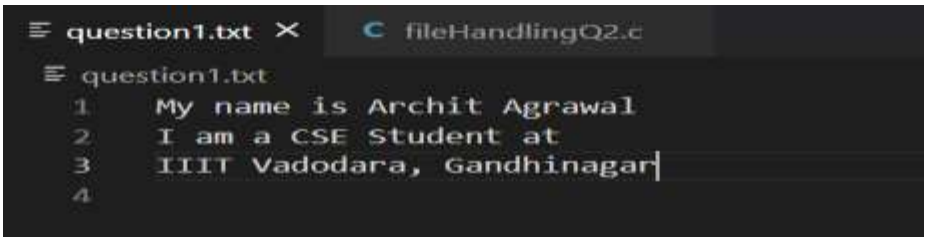
```
I walk a lonely road, the only one thay I have ever known.

```

2. Write a program in C to count a number of words and characters in a file.

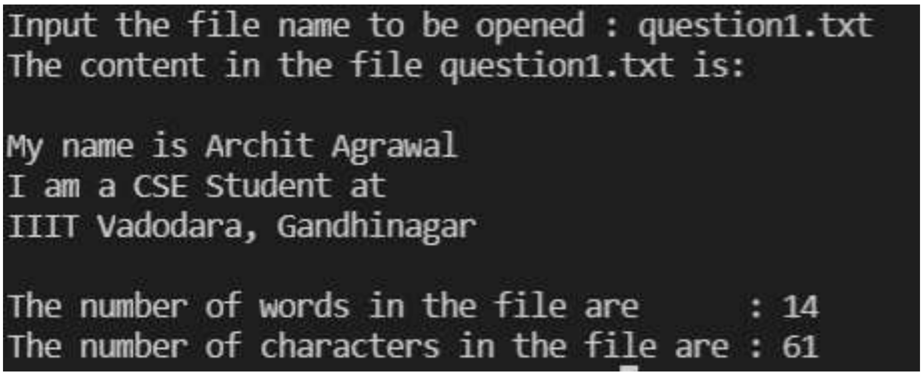
Code

```c
#include<stdio.h>
#include<stdlib.h>

void main(){

    FILE *fptr;
    char fname[20];
    printf("Input the file name to be opened : ");
    scanf("%s", fname);

    fptr = fopen(fname, "r");

    int words = 1;
    int characters = 1;

    if(fptr == NULL){
        printf("Error! File not opened.");
    } else {
        char ch = fgetc(fptr);
        printf("The content in the file %s is:\n\n", fname);

        while(ch!=EOF) {
            printf("%c",ch);
            if(ch==' '||ch=='\n') words++;
            else characters++;
            ch = fgetc(fptr);
        }
    }

    printf("\nThe number of words in the file are       : %d", words -
2);
    printf("\nThe number of characters in the file are : %d",
characters - 1);
}
```

Output



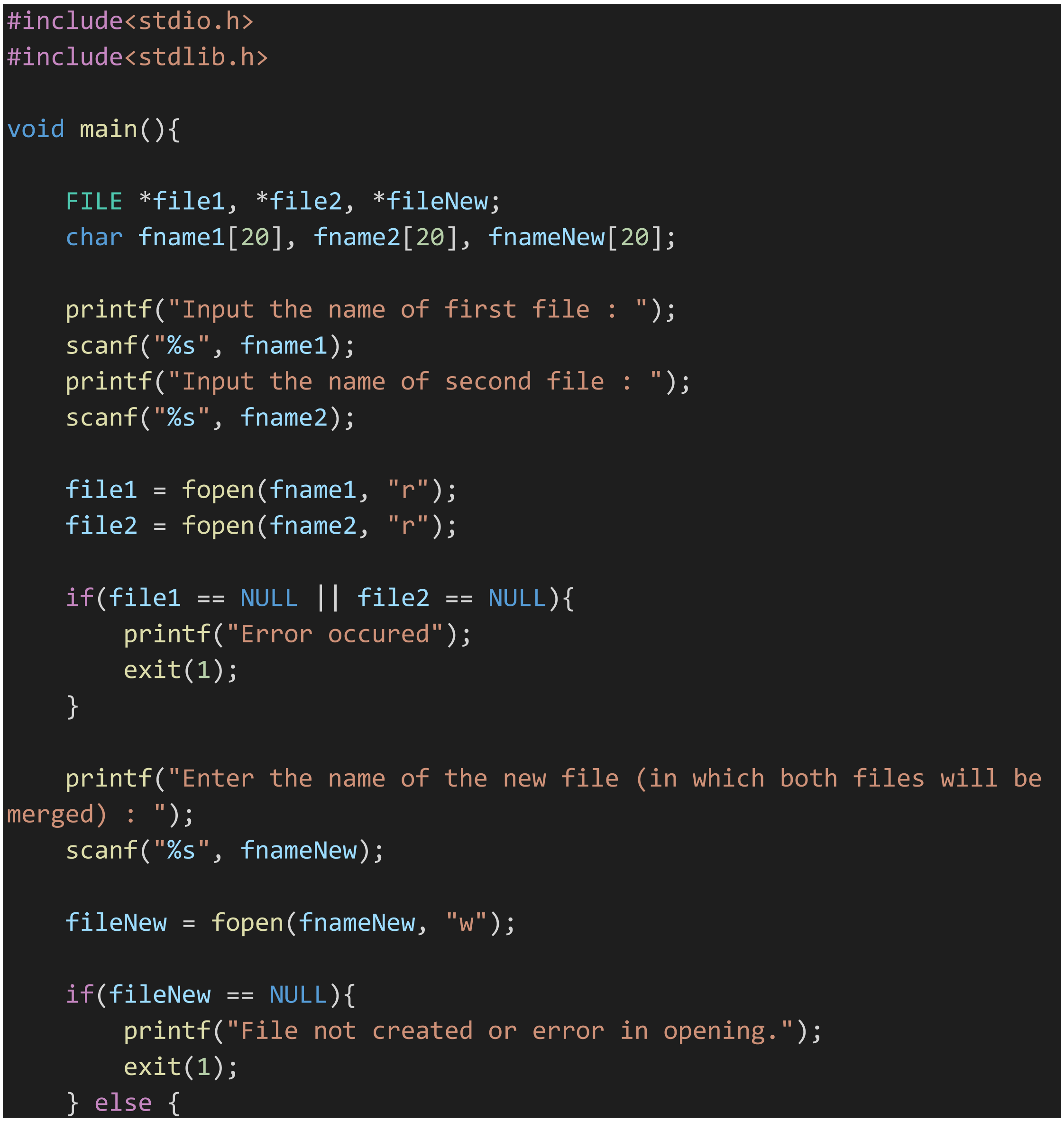
```
My name is Archit Agrawal
I am a CSE Student at
IIIT Vadodara, Gandhinagar
```



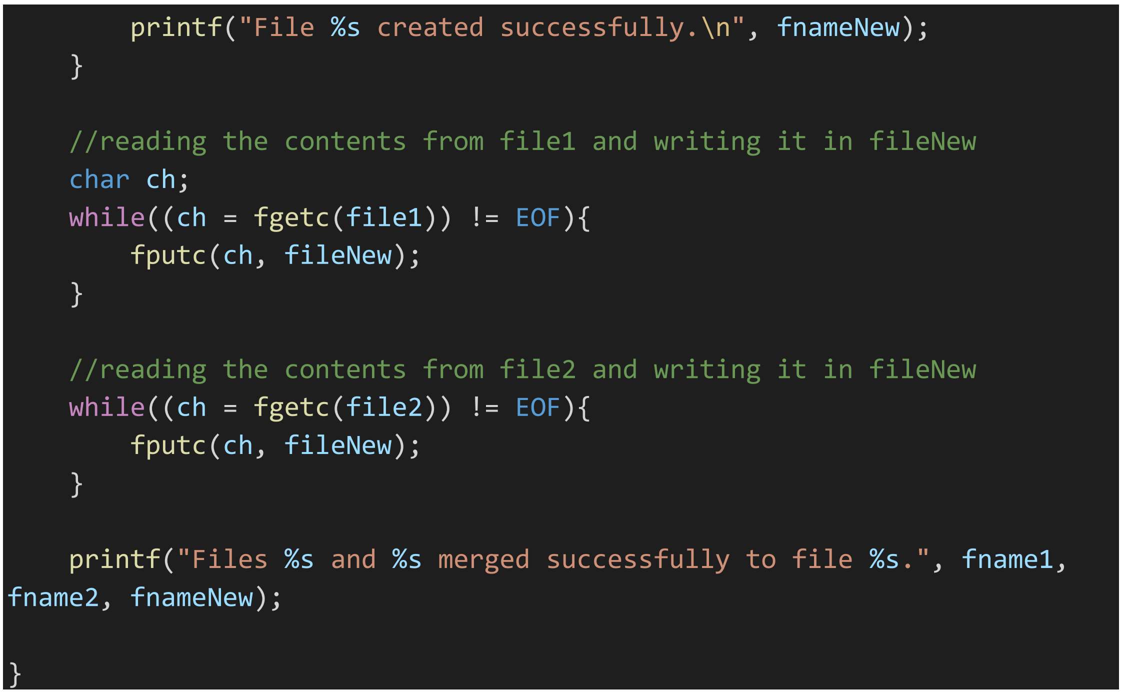
```
Input the file name to be opened : question1.txt
The content in the file question1.txt is:

My name is Archit Agrawal
I am a CSE Student at
IIIT Vadodara, Gandhinagar

The number of words in the file are      : 14
The number of characters in the file are : 61
```

3. Write a program in C to merge two files and write it in a new file.

Code

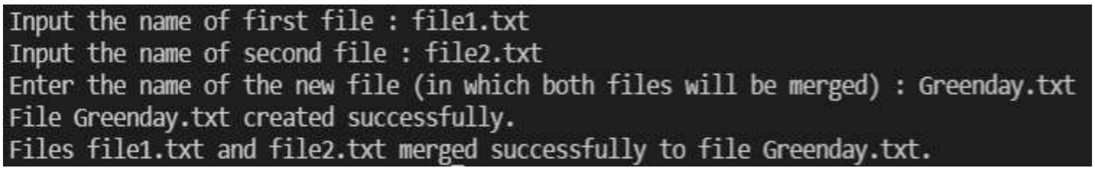


```c
#include<stdio.h>
#include<stdlib.h>

void main(){

    FILE *file1, *file2, *fileNew;
    char fname1[20], fname2[20], fnameNew[20];

    printf("Input the name of first file : ");
    scanf("%s", fname1);
    printf("Input the name of second file : ");
    scanf("%s", fname2);

    file1 = fopen(fname1, "r");
    file2 = fopen(fname2, "r");

    if(file1 == NULL || file2 == NULL){
        printf("Error occured");
        exit(1);
    }

    printf("Enter the name of the new file (in which both files will be merged) : ");
    scanf("%s", fnameNew);

    fileNew = fopen(fnameNew, "w");

    if(fileNew == NULL){
        printf("File not created or error in opening.");
        exit(1);
    } else {
```

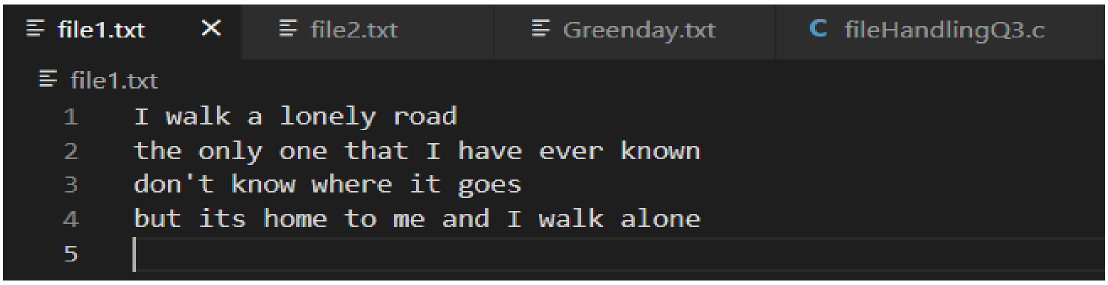


```
        printf("File %s created successfully.\n", fnameNew);
    }

    //reading the contents from file1 and writing it in fileNew
    char ch;
    while((ch = fgetc(file1)) != EOF){
        fputc(ch, fileNew);
    }

    //reading the contents from file2 and writing it in fileNew
    while((ch = fgetc(file2)) != EOF){
        fputc(ch, fileNew);
    }

    printf("Files %s and %s merged successfully to file %s.", fname1,
fname2, fnameNew);

}
```

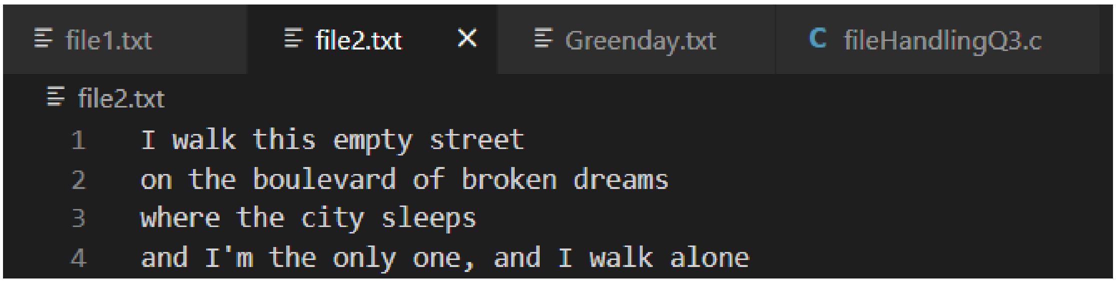
Output



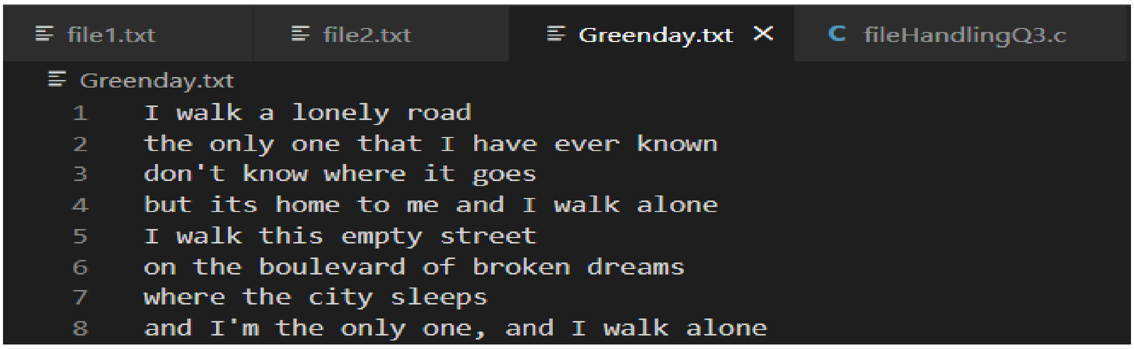
```
Input the name of first file : file1.txt
Input the name of second file : file2.txt
Enter the name of the new file (in which both files will be merged) : Greenday.txt
File Greenday.txt created successfully.
Files file1.txt and file2.txt merged successfully to file Greenday.txt.
```



```
I walk a lonely road
the only one that I have ever known
don't know where it goes
but its home to me and I walk alone

```



```
I walk this empty street
on the boulevard of broken dreams
where the city sleeps
and I'm the only one, and I walk alone
```



```
I walk a lonely road
the only one that I have ever known
don't know where it goes
but its home to me and I walk alone
I walk this empty street
on the boulevard of broken dreams
where the city sleeps
and I'm the only one, and I walk alone
```