Green University

ASSIGNMENT SHEET

Section : DE-221

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Subject : CSE-103

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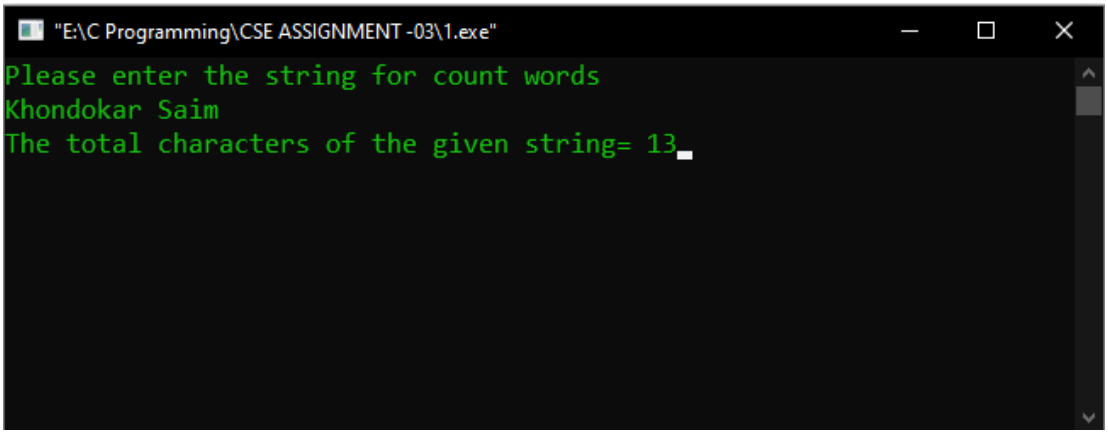
Problem-1 :

➢ C Program to find out number of total characters in a string

CODE :

```
#include <stdio.h>
#include <string.h>

int main()
{
   char str[100];//character array
   int i,totChar;//variable  declaration

   totChar=0;//variable initialization

   printf("Please enter the string for count words\n");
   gets(str);//get and store string from user

   for(i=0; str[i] != '\0'; i++)
   {
      if(str[i]!=' ')// this condition is used to avoid counting space
      {
         totChar++;//totChar=totChar+1
      }
   }

   printf("The total characters of the given string= %d",totChar);
   getch();//display total characters of the string

   return 0;
}
```

RESULT :



Problem- 2 :

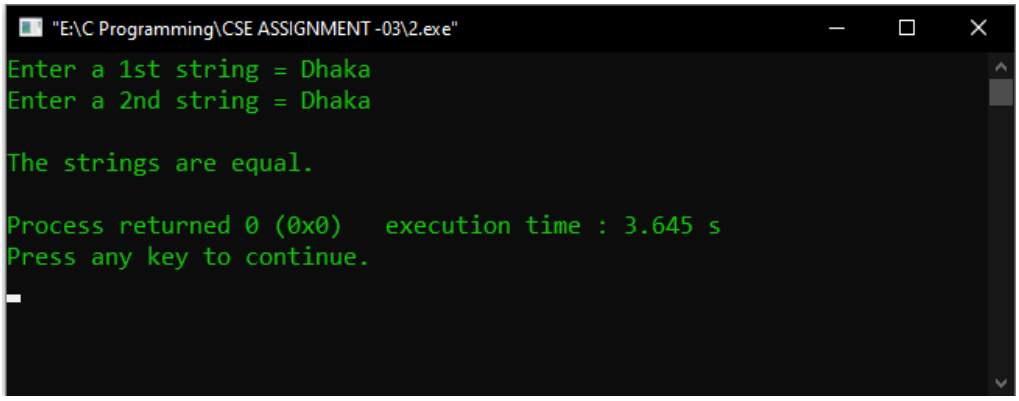
➢ C Program to compare two strings (same or not)

CODE :

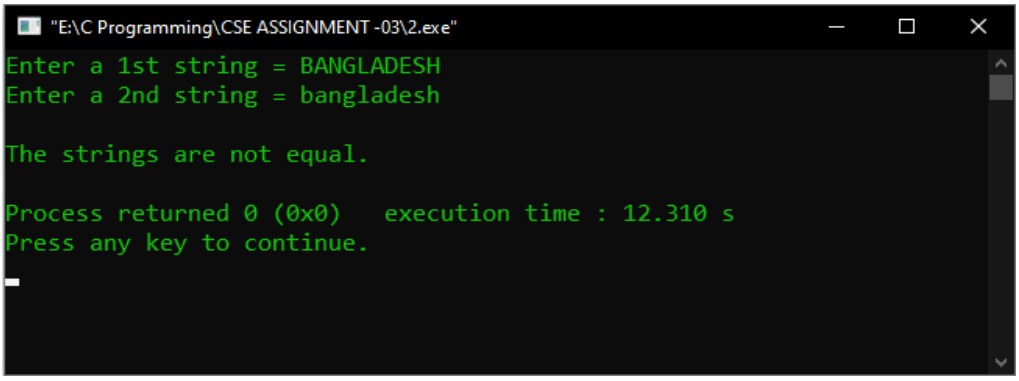
```
#include <stdio.h>
#include <string.h>
int main()
{
  char a[100], b[100];

  printf("Enter a 1st string = ");
  gets(a);

  printf("Enter a 2nd string = ");
  gets(b);

  if (strcmp(a,b) == 0)
    printf("\nThe strings are equal.\n");
  else
    printf("\nThe strings are not equal.\n");

  return 0;
}
```

RESULT :

Part - 1



Part - 2



Problem- 3 :

➢ C Program to use the functions strcpy(),strcmp(),stccat(),strncpy()

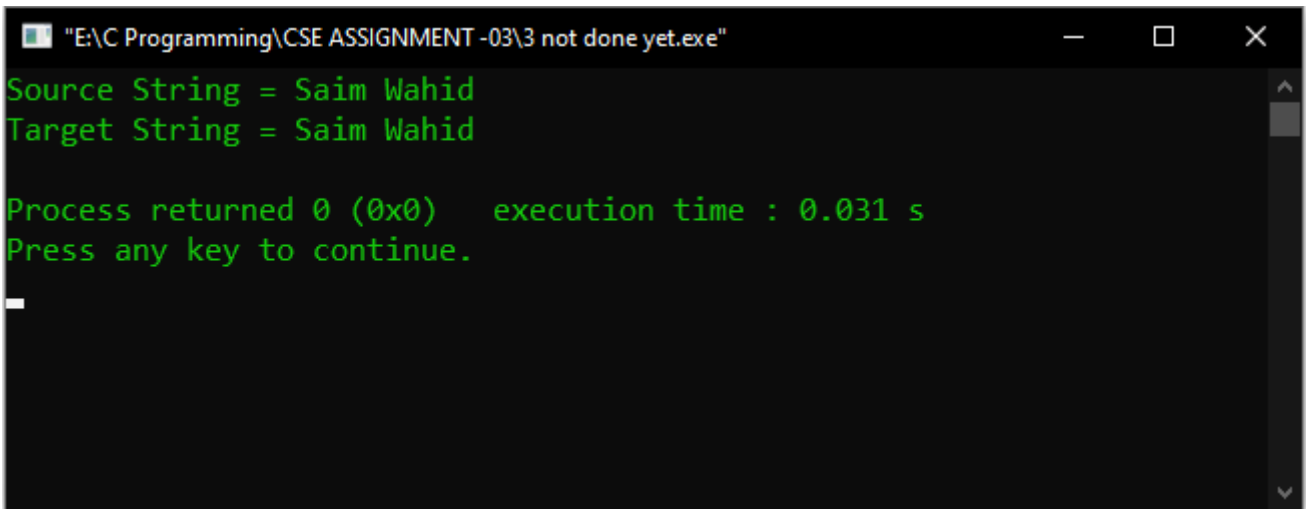
CODE :

1. strcpy() :

strcpy C function copies the contents of one string into another. The base addresses of the source and target strings should be supplied to this function.

```
#include<stdio.h>
int main()
{
   char source[] = "Saim Wahid" ;
   char target[20] ;

   /* This function copies the base address of source to target */
   strcpy (target, source) ;

   printf ("Source String = %s", source) ;
   printf ("\nTarget String = %s\n", target) ;
   return 0;
}
```

RESULT :



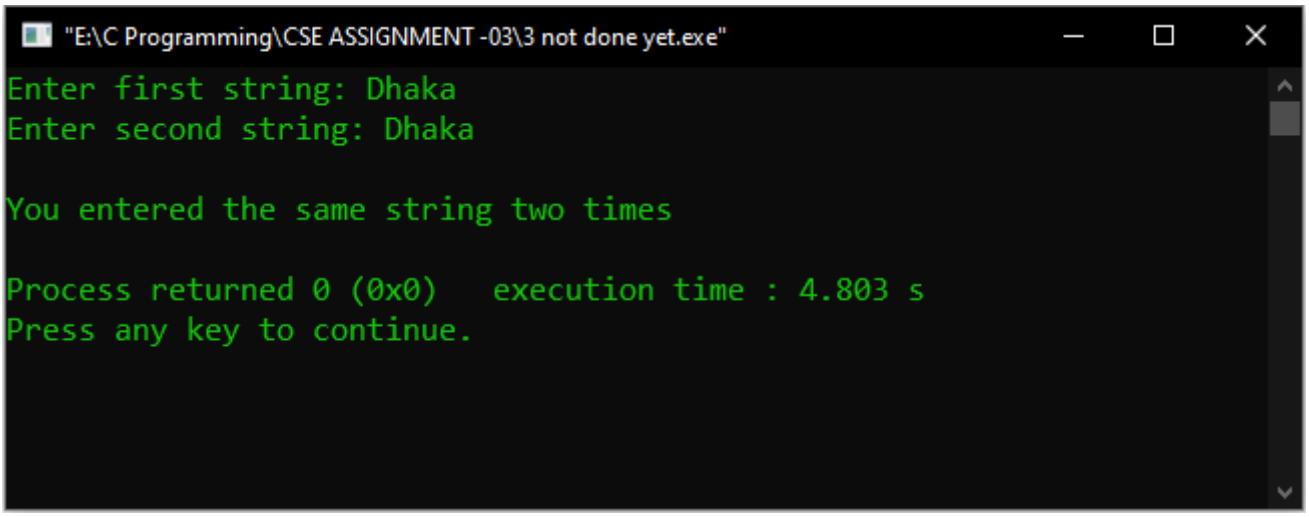
2. strcmp() :

The strcmp() function is used to compare two strings two strings str1 and str2. If two strings are same then strcmp() returns 0, otherwise, it returns a non-zero value.

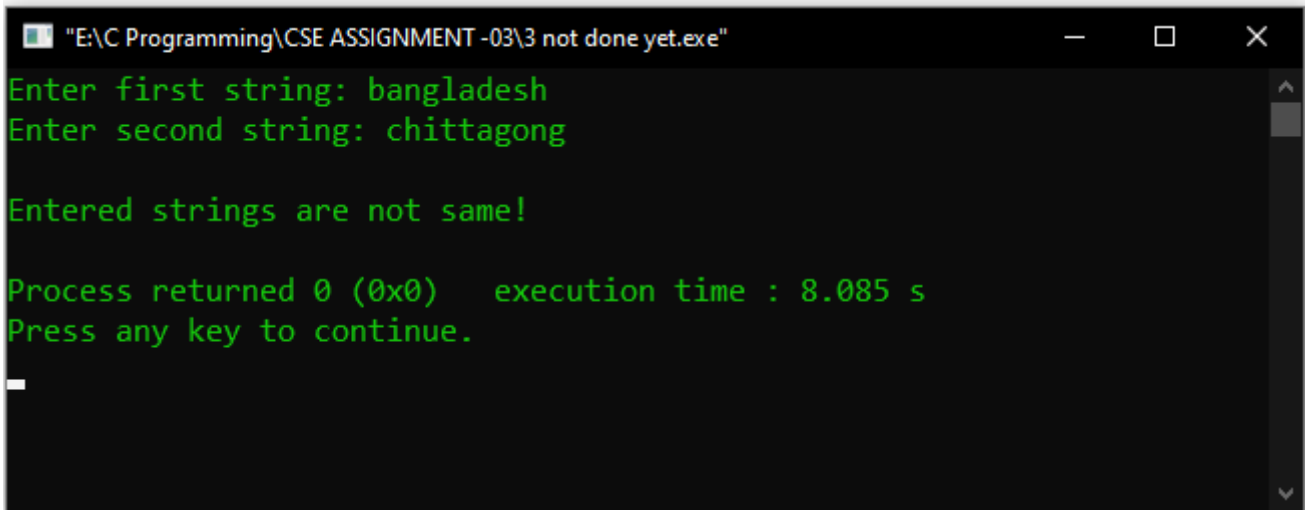
```
#include<stdio.h>
#include<string.h>

int main()
{
   char strg1[50], strg2[50];

   printf("Enter first string: ");
   gets(strg1);

   printf("Enter second string: ");
   gets(strg2);

   if(strcmp(strg1, strg2)==0)
   {
      printf("\nYou entered the same string two times\n");
   }

   else
   {
      printf("\nEntered strings are not same!\n");
   }

   // signal to operating system program ran fine
   return 0;
}
```

RESULT :

Part -1


"E:\C Programming\CSE ASSIGNMENT -03\3 not done yet.exe"
Enter first string: Dhaka
Enter second string: Dhaka
You entered the same string two times
Process returned 0 (0x0)   execution time : 4.803 s
Press any key to continue.

Part -2

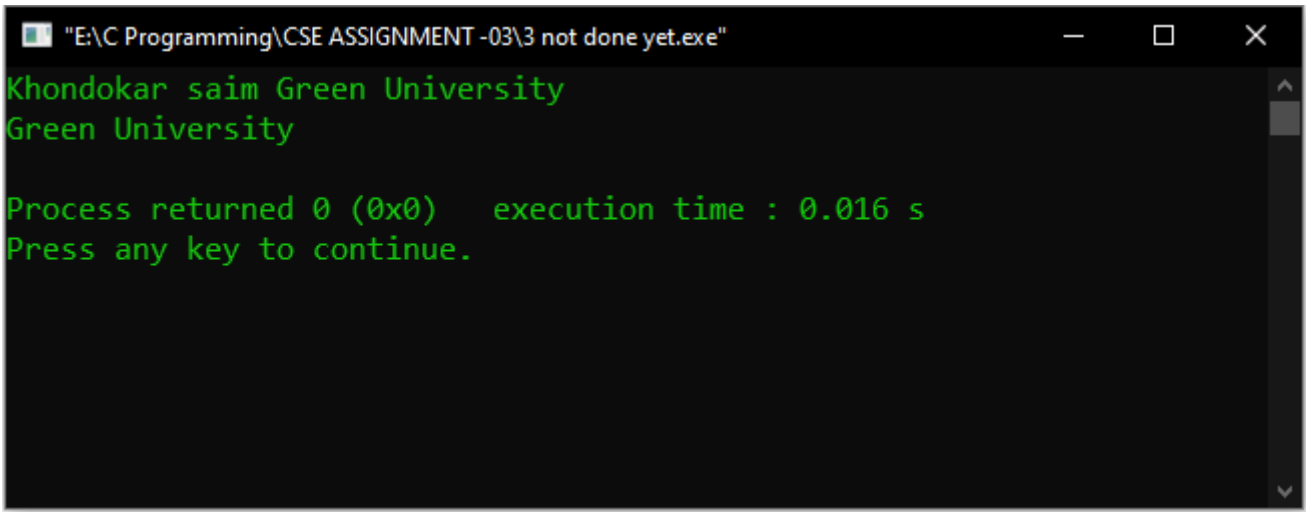

"E:\C Programming\CSE ASSIGNMENT -03\3 not done yet.exe"
Enter first string: bangladesh
Enter second string: chittagong
Entered strings are not same!
Process returned 0 (0x0)   execution time : 8.085 s
Press any key to continue.

3. stccat() :

The strcat() function concatenates the destination string and the source string, and the result is stored in the destination string.

```
//strccat
#include <stdio.h>
#include <string.h>
int main() {
  char str1[100] = "Khondokar saim ", str2[] = "Green University";

  // concatenates str1 and str2
  // the resultant string is stored in str1.
  strcat(str1, str2);

  puts(str1);
  puts(str2);

  return 0;
}
```

RESULT :

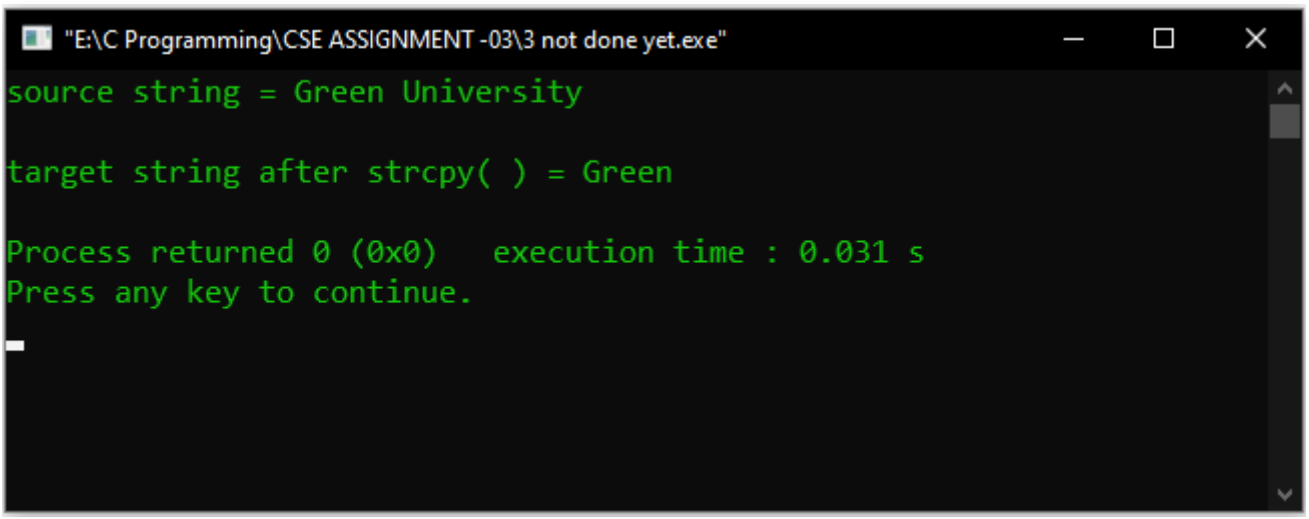


4. strncpy() :

strncpy( ) function copies portion of contents of one string into another string.

```
//strncpy
#include <stdio.h>
#include <string.h>

int main( )
{
   char source[ ] = "Green University" ;
   char target[20]= "" ;

   printf ( "\source string = %s\n", source ) ;

   strncpy ( target, source, 5 ) ;
   printf ( "\ntarget string after strcpy( ) = %s\n", target ) ;
   return 0;
}
```

RESULT :



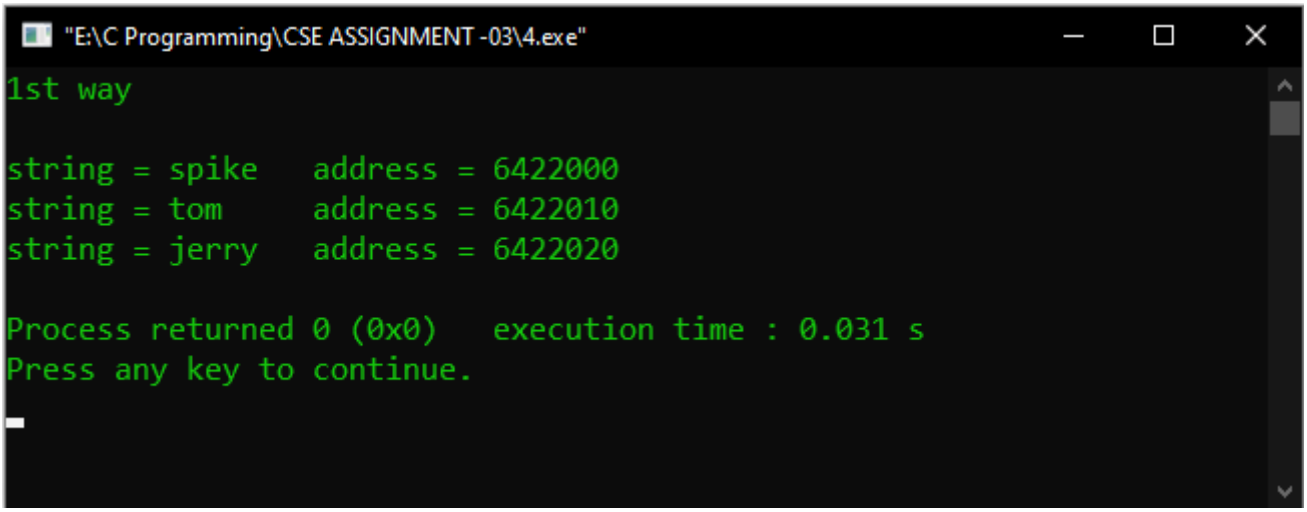
Problem- 4 :

➢ C Program to arrays of strings

CODE :

```
#include<stdio.h>
int main()
{
   int i;
   char ch_arr[3][10] = {
                        "spike",
                        "tom",
                        "jerry"
                       };

   printf("1st way \n\n");

   for(i = 0; i < 3; i++)
   {
      printf("string = %s \t address = %u\n", ch_arr + i, ch_arr + i);
   }

   return 0;
}
```

RESULT :



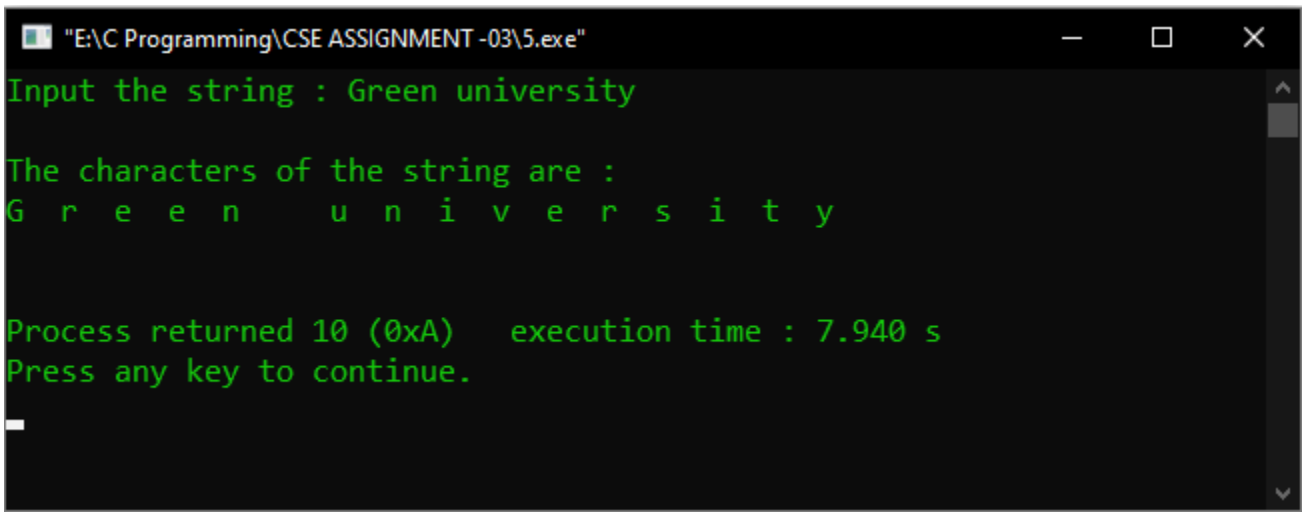
Problem- 5 :

- C Program to access each character of a string and print separately

CODE :

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


void main()
{
   char str[100]; /* Declares a string of size 100 */
   int l= 0;

     printf("Input the string : ");
     fgets(str, sizeof str, stdin);
          printf("\nThe characters of the string are : \n");
   while(str[l]!='\0')
   {
     printf("%c  ", str[l]);
     l++;
   }
   printf("\n");
}
```

RESULT :



Problem- 6 :

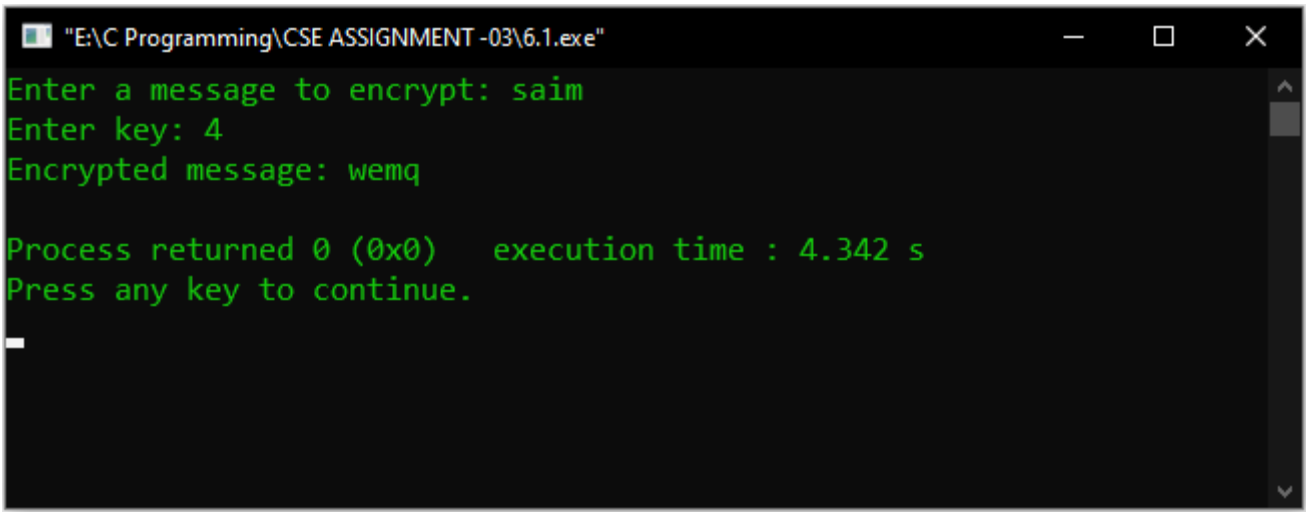
➢ C Program Caesar cipher encryption and decryption

CODE :

Encryption

```
#include<stdio.h>
int main()
{
   char message[100], ch;
   int i, key;

   printf("Enter a message to encrypt: ");
   gets(message);

   printf("Enter key: ");
   scanf("%d", &key);

   for(i = 0; message[i] != '\0'; ++i){
   ch = message[i];

   if(ch >= 'a' && ch <= 'z'){
   ch = ch + key;

   if(ch > 'z'){
   ch = ch - 'z' + 'a' - 1;
   }
   message[i] = ch;
   }

   else if(ch >= 'A' && ch <= 'Z'){
   ch = ch + key;

   if(ch > 'Z'){
   ch = ch - 'Z' + 'A' - 1;
   }
   message[i] = ch;
   }
   }

   printf("Encrypted message: %s\n", message);
   return 0;
}
```

RESULT :

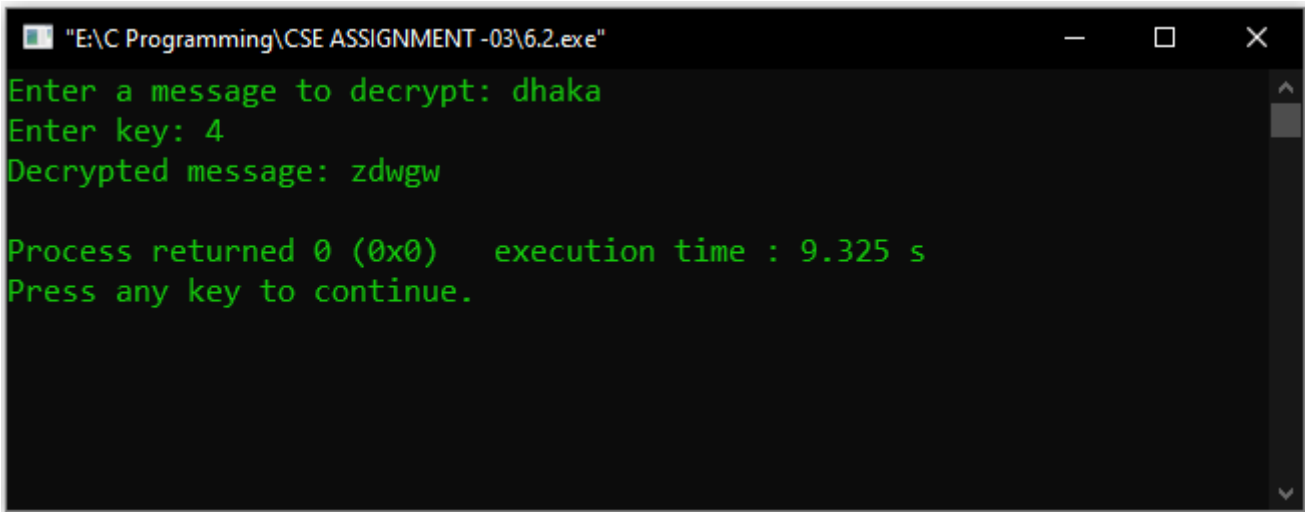


Decryption

```
#include<stdio.h>
int main()
{
   char message[100], ch;
   int i, key;
   printf("Enter a message to decrypt: ");
   gets(message);

   printf("Enter key: ");
   scanf("%d", &key);

   for(i = 0; message[i] != '\0'; ++i){
   ch = message[i];

   if(ch >= 'a' && ch <= 'z'){
   ch = ch - key;

   if(ch < 'a'){
   ch = ch + 'z' - 'a' + 1;
   }
   message[i] = ch;
   }

   else if(ch >= 'A' && ch <= 'Z'){
   ch = ch - key;
```

```
    if(ch < 'A'){
    ch = ch + 'Z' - 'A' + 1;
    }
    message[i] = ch;
    }
    }
    printf("Decrypted message: %s\n", message);
    return 0;
}
```

RESULT :



Problem- 7 :

- C Program Dynamic Memory Allocation, use of malloc( ),calloc( ), free( ), realloc( )

CODE :

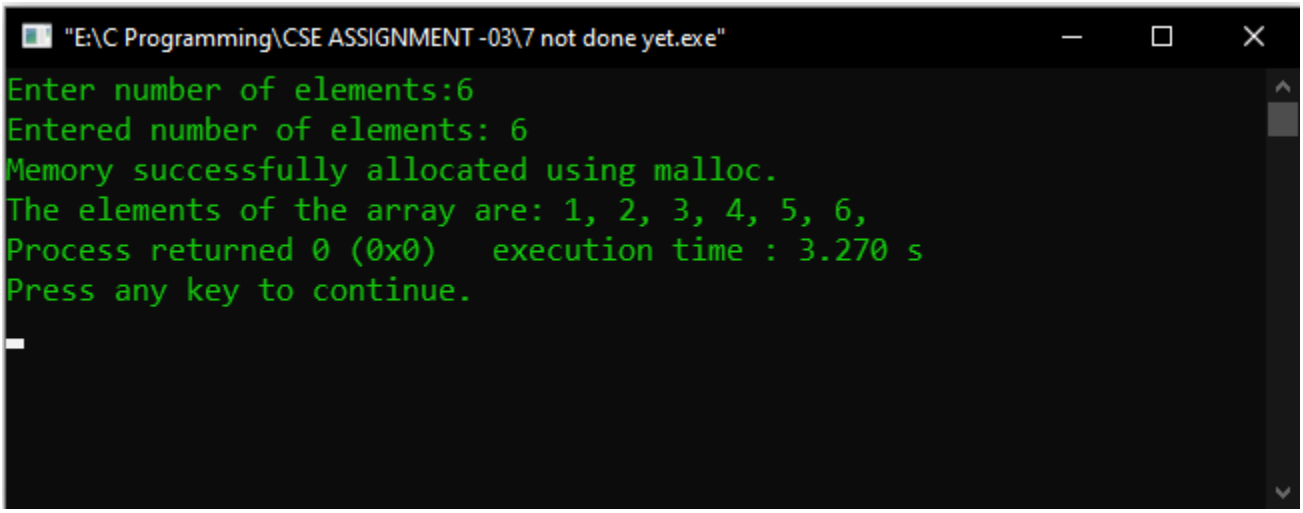
1. malloc( ) :

The “malloc” or “memory allocation” method in C is used to dynamically allocate a single large block of memory with the specified size.

```
//malloc
#include <stdio.h>
#include <stdlib.h>
int main()
{
    int* ptr;
    int n, i;

    // Get the number of elements for the array
    printf("Enter number of elements:");
    scanf("%d",&n);
    printf("Entered number of elements: %d\n", n);

    // Dynamically allocate memory using malloc()
    ptr = (int*)malloc(n * sizeof(int));

    // Check if the memory has been successfully
    // allocated by malloc or not
    if (ptr == NULL) {
        printf("Memory not allocated.\n");
        exit(0);
    }
    else {

        // Memory has been successfully allocated
        printf("Memory successfully allocated using malloc.\n");

        // Get the elements of the array
        for (i = 0; i < n; ++i) {
            ptr[i] = i + 1;
        }
```

```
        // Print the elements of the array
        printf("The elements of the array are: ");
        for (i = 0; i < n; ++i) {
            printf("%d, ", ptr[i]);
        }
    }

    return 0;
}
```

RESULT :



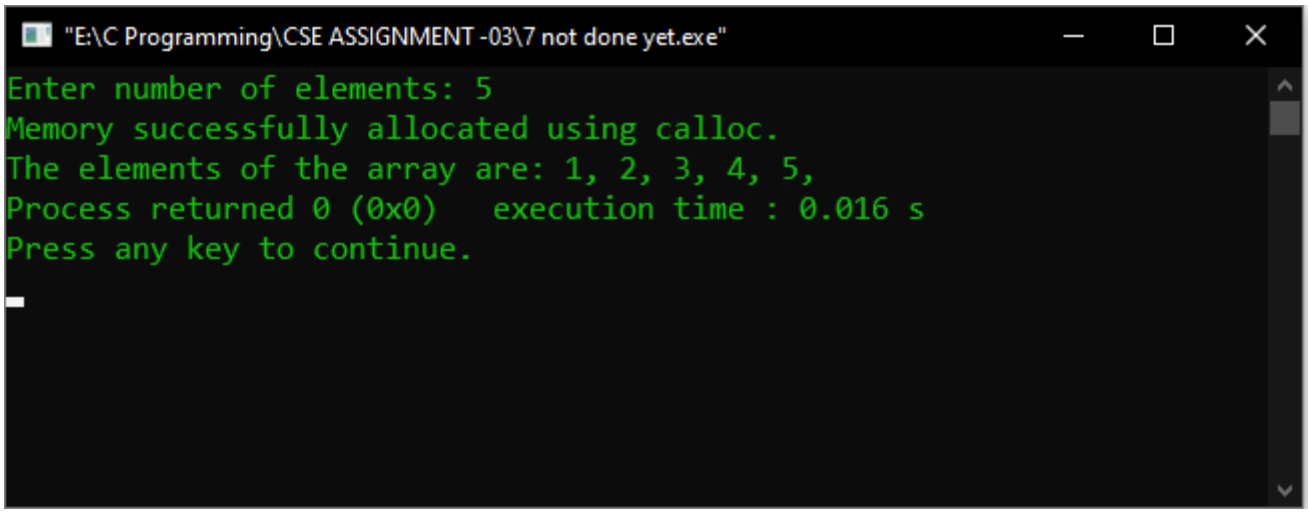
2. calloc( ) :

“calloc” or “contiguous allocation” method in C is used to dynamically allocate the specified number of blocks of memory of the specified type.

```
//calloc
#include <stdio.h>
#include <stdlib.h>

int main()
{

    // This pointer will hold the
    // base address of the block created
    int* ptr;
    int n, i;

    // Get the number of elements for the array
    n = 5;
    printf("Enter number of elements: %d\n", n);

    // Dynamically allocate memory using calloc()
    ptr = (int*)calloc(n, sizeof(int));

    // Check if the memory has been successfully
    // allocated by calloc or not
    if (ptr == NULL) {
        printf("Memory not allocated.\n");
        exit(0);
    }
    else {

        // Memory has been successfully allocated
        printf("Memory successfully allocated using calloc.\n");

        // Get the elements of the array
        for (i = 0; i < n; ++i) {
            ptr[i] = i + 1;
        }

        // Print the elements of the array
        printf("The elements of the array are: ");
        for (i = 0; i < n; ++i) {
            printf("%d, ", ptr[i]);
        }
```

```
    return 0;
}
```

RESULT :



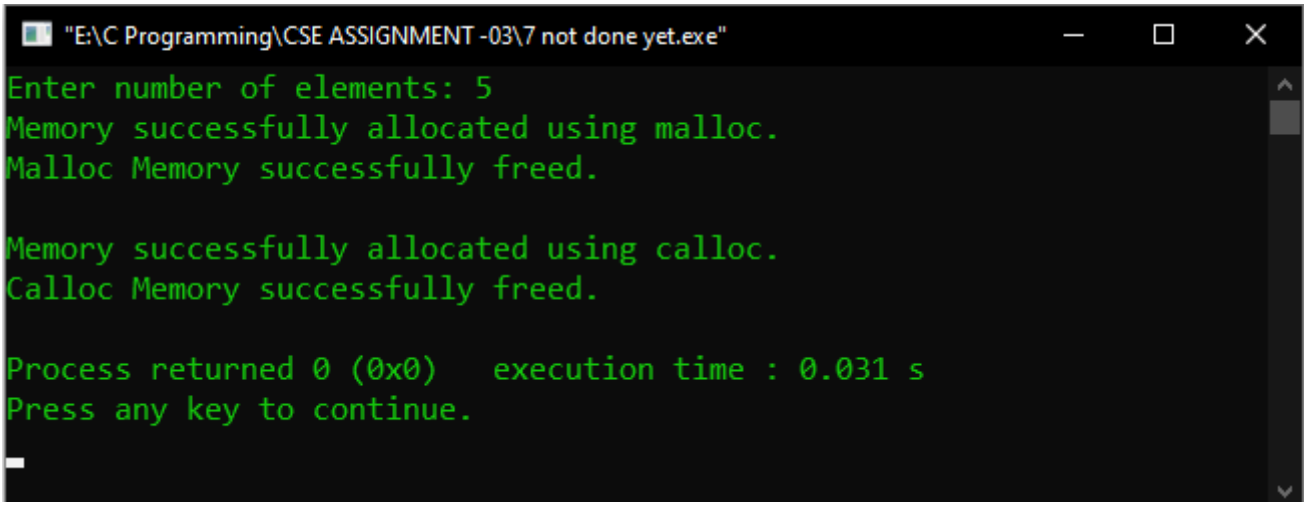
3. free( ) :

“free” method in C is used to dynamically de-allocate the memory. The memory allocated using functions malloc() and calloc() is not de-allocated on their own. Hence the free() method is used, whenever the dynamic memory allocation takes place. It helps to reduce wastage of memory by freeing it.

```
//free
#include <stdio.h>
#include <stdlib.h>

int main()
{

    // This pointer will hold the
    // base address of the block created
    int *ptr, *ptr1;
    int n, i;

    // Get the number of elements for the array
    n = 5;
    printf("Enter number of elements: %d\n", n);

    // Dynamically allocate memory using malloc()
    ptr = (int*)malloc(n * sizeof(int));

    // Dynamically allocate memory using calloc()
    ptr1 = (int*)calloc(n, sizeof(int));

    // Check if the memory has been successfully
    // allocated by malloc or not
    if (ptr == NULL || ptr1 == NULL) {
        printf("Memory not allocated.\n");
        exit(0);
    }
    else {

        // Memory has been successfully allocated
        printf("Memory successfully allocated using malloc.\n");

        // Free the memory
        free(ptr);
        printf("Malloc Memory successfully freed.\n");
```

```
        // Memory has been successfully allocated
        printf("\nMemory successfully allocated using calloc.\n");

        // Free the memory
        free(ptr1);
        printf("Calloc Memory successfully freed.\n");
    }

    return 0;
}
```

RESULT :



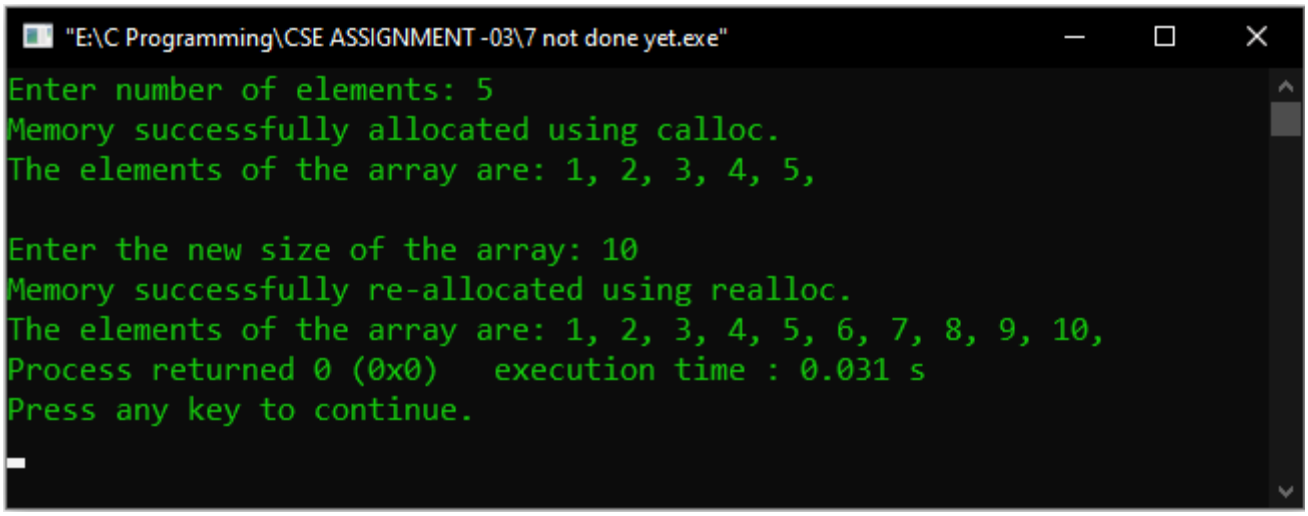
4. realloc( ) :

“realloc” or “re-allocation” method in C is used to dynamically change the memory allocation of a previously allocated memory.

```
//relloc
#include <stdio.h>
#include <stdlib.h>

int main()
{

    // This pointer will hold the
    // base address of the block created
    int* ptr;
    int n, i;

    // Get the number of elements for the array
    n = 5;
    printf("Enter number of elements: %d\n", n);

    // Dynamically allocate memory using calloc()
    ptr = (int*)calloc(n, sizeof(int));

    // Check if the memory has been successfully
    // allocated by malloc or not
    if (ptr == NULL) {
        printf("Memory not allocated.\n");
        exit(0);
    }
    else {

        // Memory has been successfully allocated
        printf("Memory successfully allocated using calloc.\n");

        // Get the elements of the array
        for (i = 0; i < n; ++i) {
            ptr[i] = i + 1;
        }

        // Print the elements of the array
        printf("The elements of the array are: ");
        for (i = 0; i < n; ++i) {
            printf("%d, ", ptr[i]);
        }
```

```
        // Get the new size for the array
        n = 10;
        printf("\n\nEnter the new size of the array: %d\n", n);

        // Dynamically re-allocate memory using realloc()
        ptr = realloc(ptr, n * sizeof(int));

        // Memory has been successfully allocated
        printf("Memory successfully re-allocated using realloc.\n");

        // Get the new elements of the array
        for (i = 5; i < n; ++i) {
            ptr[i] = i + 1;
        }

        // Print the elements of the array
        printf("The elements of the array are: ");
        for (i = 0; i < n; ++i) {
            printf("%d, ", ptr[i]);
        }

        free(ptr);
    }

    return 0;
}
```

RESULT :


"E:\C Programming\CSE ASSIGNMENT -03\7 not done yet.exe"
Enter number of elements: 5
Memory successfully allocated using calloc.
The elements of the array are: 1, 2, 3, 4, 5,
Enter the new size of the array: 10
Memory successfully re-allocated using realloc.
The elements of the array are: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10,
Process returned 0 (0x0)   execution time : 0.031 s
Press any key to continue.

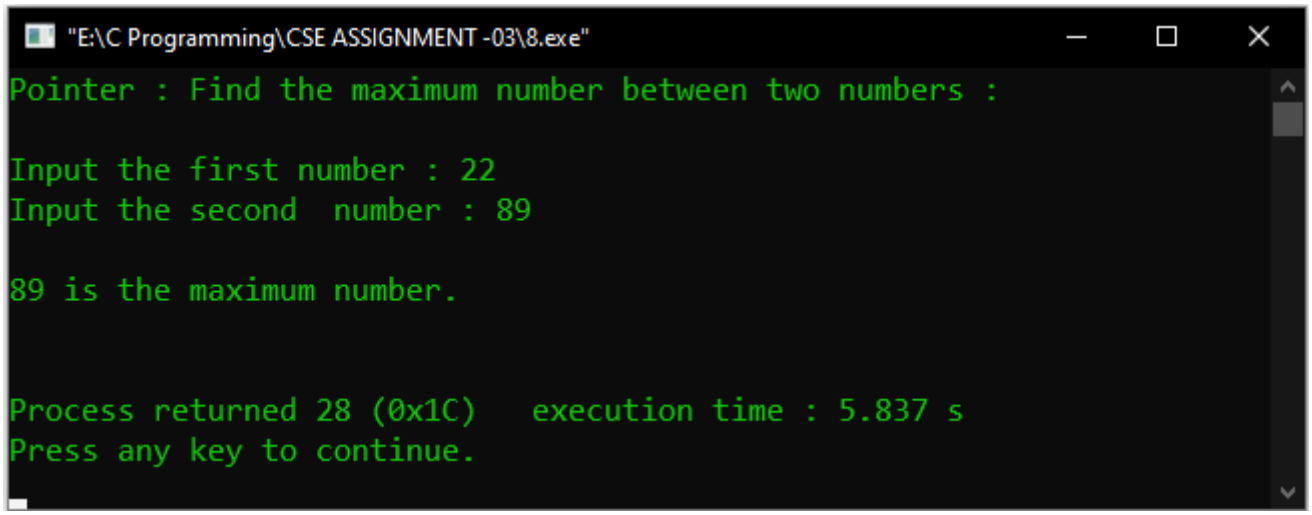
Problem- 8 :

➢ C Program find maximum or minimum value using pointer

CODE :

```
#include <stdio.h>
#include <stdlib.h>
void main()
{
 int fno,sno,*ptr1=&fno,*ptr2=&sno;

   printf("Pointer : Find the maximum number between two numbers
:\n");


   printf("\nInput the first number : ");
   scanf("%d", ptr1);
   printf("Input the second  number : ");
   scanf("%d", ptr2);


 if(*ptr1>*ptr2)
 {
  printf("\n%d is the maximum number.\n\n",*ptr1);
 }
 else
 {
  printf("\n%d is the maximum number.\n\n",*ptr2);
 }

}
```

RESULT :



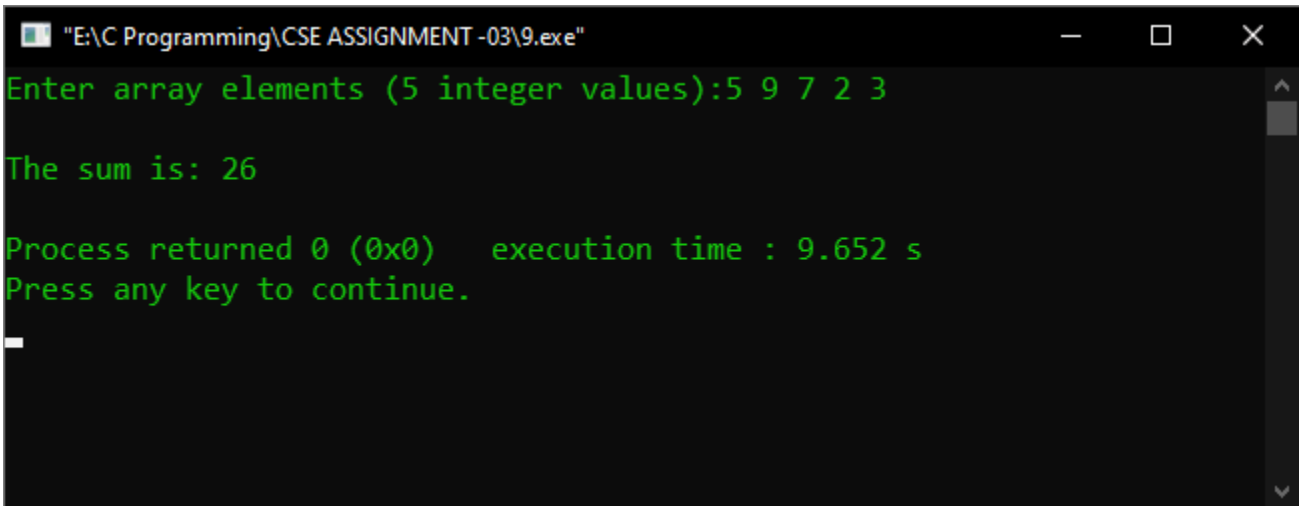
Problem- 9 :

➢ C Program calculate sum of an array using a pointer of that array.

CODE :

```
#include<stdio.h>
int main()
{
  int array[5];
  int i, sum=0;
  int *ptr;

  printf("Enter array elements (5 integer values):");
  for(i=0;i<5;i++)
    scanf("%d",&array[i]);

  ptr = array;

  for(i=0;i<5;i++)
  {
    sum = sum + *ptr;
    ptr++;
  }

  printf("\nThe sum is: %d\n",sum);
}
```

RESULT :



Problem- 10 :

➢ How to initialize/declare structure, taking input and output.

1. Declaration of structure variable

Let us declare a student structure containing three fields i.e. name, roll and marks.

```
struct student
{

char name[100];
int roll;
float marks;

};
```

2. initialize a structure variable

C language supports multiple ways to initialize a structure variable. You can use any of the initialization method to initialize your structure.

- Initialize using dot operator
- Value initialized structure variable
- Variant of value initialized structure variable

Initialize using dot operator :

```
// Declare structure variable
struct student stu1;

// Initialize structure members
stu1.name = "Pankaj";
stu1.roll = 12;
stu1.marks = 79.5f;
```

Value initialized structure variable :

```
// Declare and initialize structure variable
struct student stu1 = { "Pankaj", 12, 79.5f };
```

Variant of value initialized structure variable :

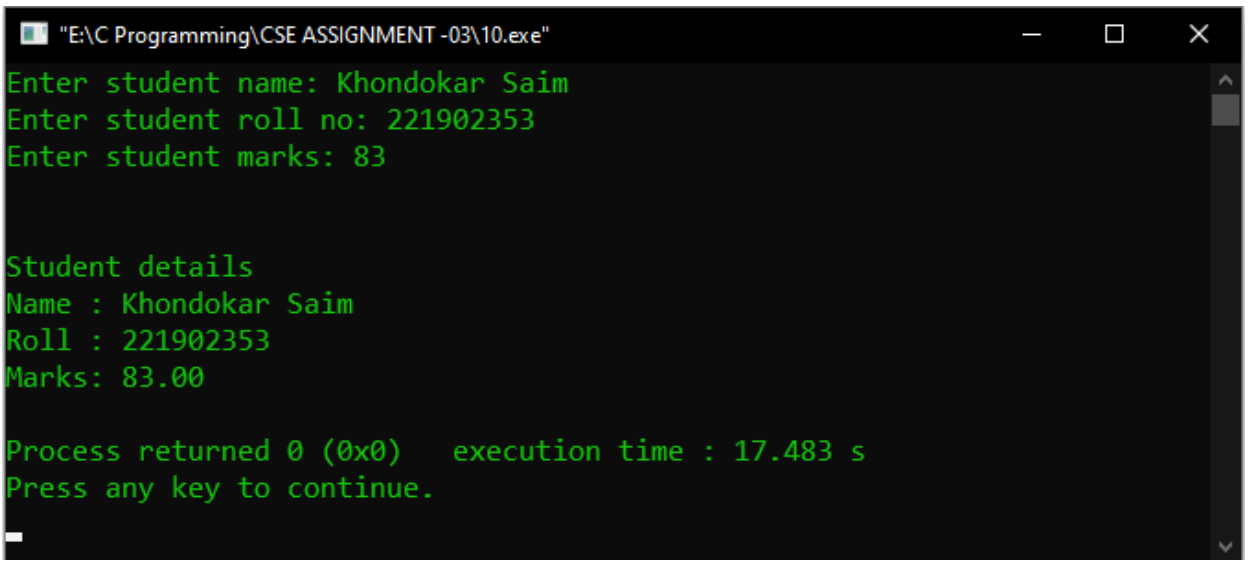
```
// Declare and initialize structure variable
struct student stu1 = {
.roll = 12,
.name = "Pankaj",
.marks = 79.5f

};
```

CODE :

```
//How to declare, initialize and access structures in C language
#include <stdio.h>

// Macro for default student structure initialization
#define NEW_STUDENT { "", 0, 0.0f }

// Student structure type declaration
struct student
{
   char    name[100];
   int     roll;
   float   marks;
};

int main()
{
   // Declare structure variable with default initialization
   struct student stu1 = NEW_STUDENT;

   // Read student details from user
   printf("Enter student name: ");
   gets(stu1.name);

   printf("Enter student roll no: ");
   scanf("%d", &stu1.roll);

   printf("Enter student marks: ");
   scanf("%f", &stu1.marks);
```

```
    // Print student details
    printf("\n\nStudent details\n");
    printf("Name : %s\n",   stu1.name);
    printf("Roll : %d\n",   stu1.roll);
    printf("Marks: %.2f\n", stu1.marks);

    return 0;
}
```

RESULT :



Problem- 11 :

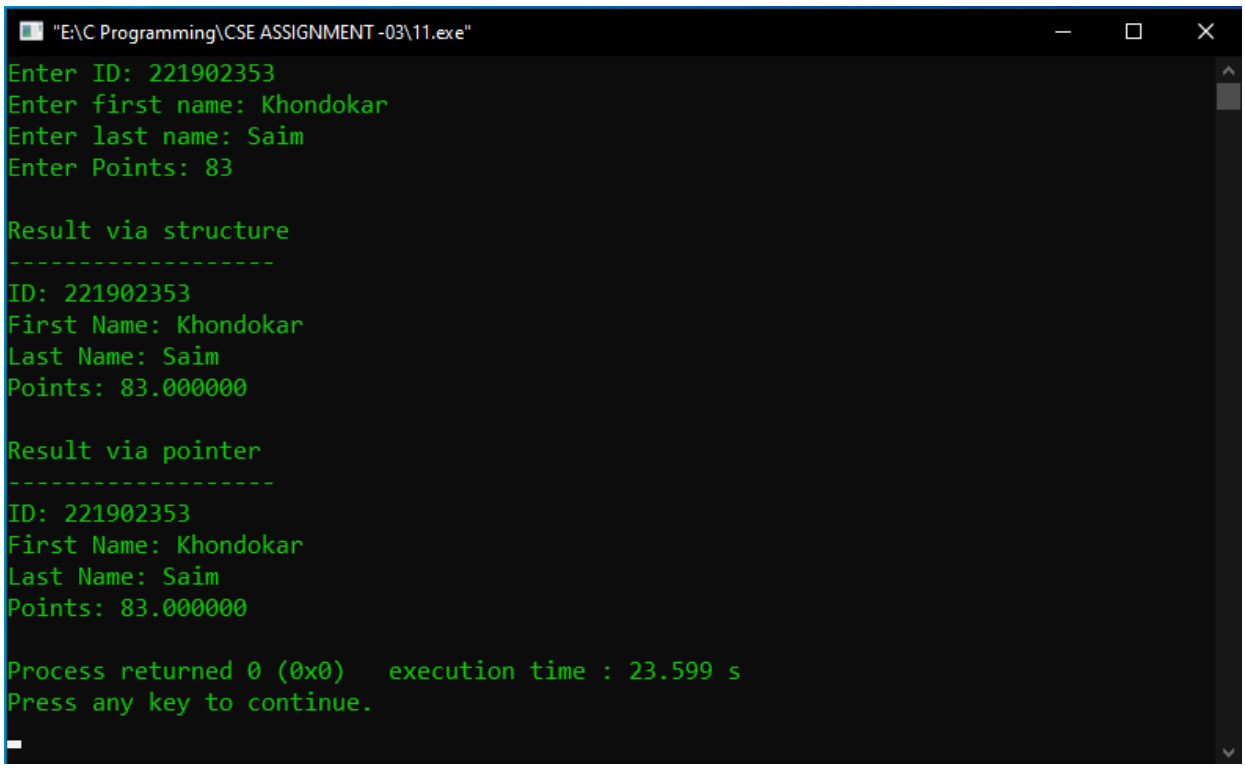
- structure using pointer. create and assign value using pointers

CODE :

```
#include <stdio.h>

int main(void)
{
   // student structure
   struct student
  {
   char id[15];
   char firstname[64];
   char lastname[64];
   float points;
  };

  // student structure variable
  struct student std;

  // student structure pointer variable
  struct student *ptr = NULL;

  // assign std to ptr
  ptr = &std;

  // get student detail from user
  printf("Enter ID: ");
  scanf("%s", ptr->id);
  printf("Enter first name: ");
  scanf("%s", ptr->firstname);
  printf("Enter last name: ");
  scanf("%s", ptr->lastname);
  printf("Enter Points: ");
  scanf("%f", &ptr->points);

  // display result via structure variable
  printf("\nResult via structure");
  printf("\n------------------\n");
  printf("ID: %s\n", std.id);
  printf("First Name: %s\n", std.firstname);
  printf("Last Name: %s\n", std.lastname);
  printf("Points: %f\n", std.points);
```

```
  // display result via pointer variable
  printf("\nResult via pointer");
  printf("\n-------------------\n");
  printf("ID: %s\n", ptr->id);
  printf("First Name: %s\n", ptr->firstname);
  printf("Last Name: %s\n", ptr->lastname);
  printf("Points: %f\n", ptr->points);

  return 0;
}
```

RESULT :



Problem- 12 :

- create a student information management system using structure where you can add info, show info, update info, delete info

CODE :

```
#include<stdlib.h>
#include<string.h>
#include<stdio.h>
struct Student
{
   int rollnumber;
   char name[100];
   char phone[100];
   float percentage;
   struct Student *next;

}* head;
void insert(int rollnumber, char* name, char* phone, float
percentage)
{

   struct Student * student = (struct Student *) malloc(sizeof(struct
Student));
   student->rollnumber = rollnumber;
   strcpy(student->name, name);
   strcpy(student->phone, phone);
   student->percentage = percentage;
   student->next = NULL;

   if(head==NULL){

      head = student;
   }
   else{

      student->next = head;
      head = student;
   }

}
```

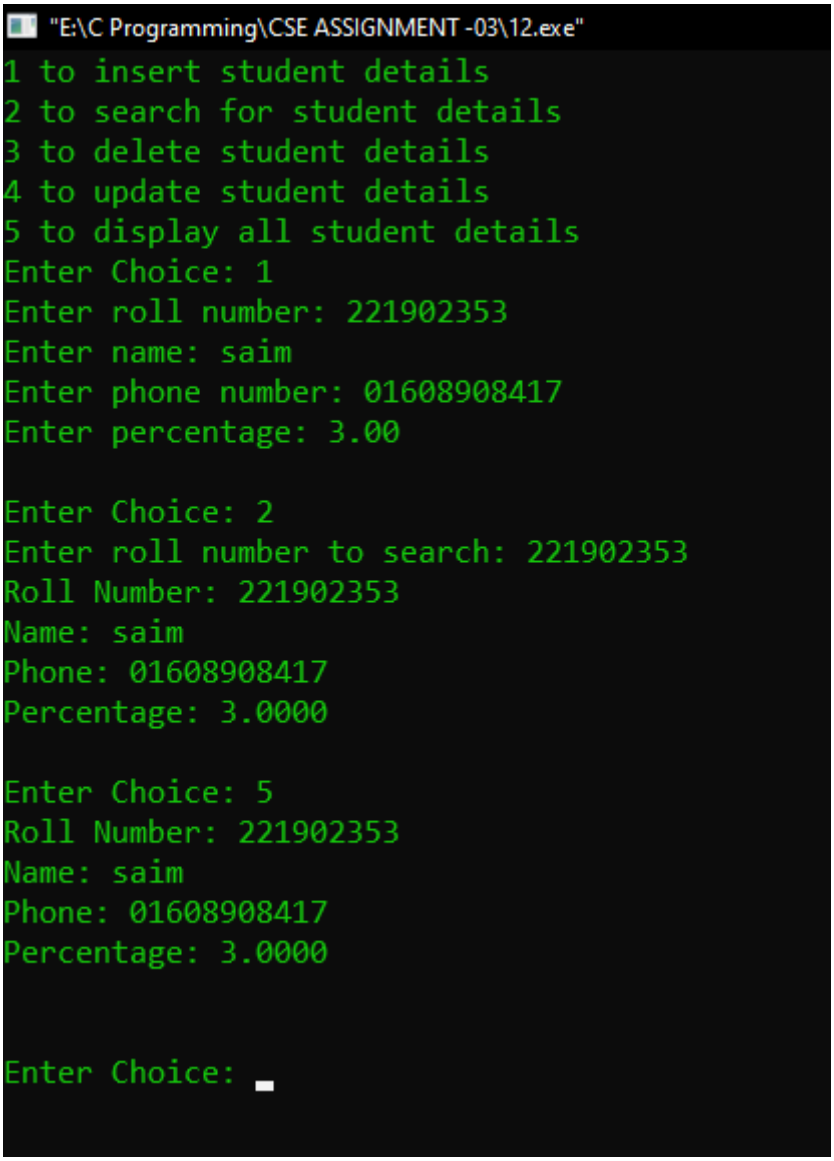
```
void search(int rollnumber)
{
   struct Student * temp = head;
   while(temp!=NULL){
      if(temp->rollnumber==rollnumber){
         printf("Roll Number: %d\n", temp->rollnumber);
         printf("Name: %s\n", temp->name);
         printf("Phone: %s\n", temp->phone);
         printf("Percentage: %0.4f\n", temp->percentage);
         return;
      }
      temp = temp->next;
   }
   printf("Student with roll number %d is not found !!!\n", rollnumber);
}
void update(int rollnumber)
{

   struct Student * temp = head;
   while(temp!=NULL){

      if(temp->rollnumber==rollnumber){
         printf("Record with roll number %d Found !!!\n", rollnumber);
         printf("Enter new name: ");
         scanf("%s", temp->name);
         printf("Enter new phone number: ");
         scanf("%s", temp->phone);
         printf("Enter new percentage: ");
         scanf("%f",&temp->percentage);
         printf("Updation Successful!!!\n");
         return;
      }
      temp = temp->next;

   }
   printf("Student with roll number %d is not found !!!\n", rollnumber);

}
void Delete(int rollnumber)
{
   struct Student * temp1 = head;
   struct Student * temp2 = head;
   while(temp1!=NULL)
{
```

```
        if(temp1->rollnumber==rollnumber){

            printf("Record with roll number %d Found !!!\n", rollnumber);

            if(temp1==temp2){

                head = head->next;
                free(temp1);
            }
            else{

                temp2->next = temp1->next;
                free(temp1);
            }

            printf("Record Successfully Deleted !!!\n");
            return;

        }
        temp2 = temp1;
        temp1 = temp1->next;

    }
    printf("Student with roll number %d is not found !!!\n", rollnumber);

}
void display()
{
    struct Student * temp = head;
    while(temp!=NULL){

        printf("Roll Number: %d\n", temp->rollnumber);
        printf("Name: %s\n", temp->name);
        printf("Phone: %s\n", temp->phone);
        printf("Percentage: %0.4f\n\n", temp->percentage);
        temp = temp->next;

    }
}
int main()
{
```

```
head = NULL;
    int choice;
    char name[100];
    char phone[100];
    int rollnumber;
    float percentage;
    printf("1 to insert student details\n2 to search for student
details\n3 to delete student details\n4 to update student details\n5 to
display all student details");
    do
    {
        printf("\nEnter Choice: ");
        scanf("%d", &choice);
        switch (choice)
        {
            case 1:
                printf("Enter roll number: ");
                scanf("%d", &rollnumber);
                printf("Enter name: ");
                scanf("%s", name);
                printf("Enter phone number: ");
                scanf("%s", phone);
                printf("Enter percentage: ");
                scanf("%f", &percentage);
                insert(rollnumber, name, phone, percentage);
                break;
            case 2:
                printf("Enter roll number to search: ");
                scanf("%d", &rollnumber);
                search(rollnumber);
                break;
            case 3:
                printf("Enter roll number to delete: ");
                scanf("%d", &rollnumber);
                Delete(rollnumber);
                break;
            case 4:
                printf("Enter roll number to update: ");
                scanf("%d", &rollnumber);
                update(rollnumber);
                break;
            case 5:
                display();
                break;
        }
```

```
    } while (choice != 0);
}
```

RESULT :



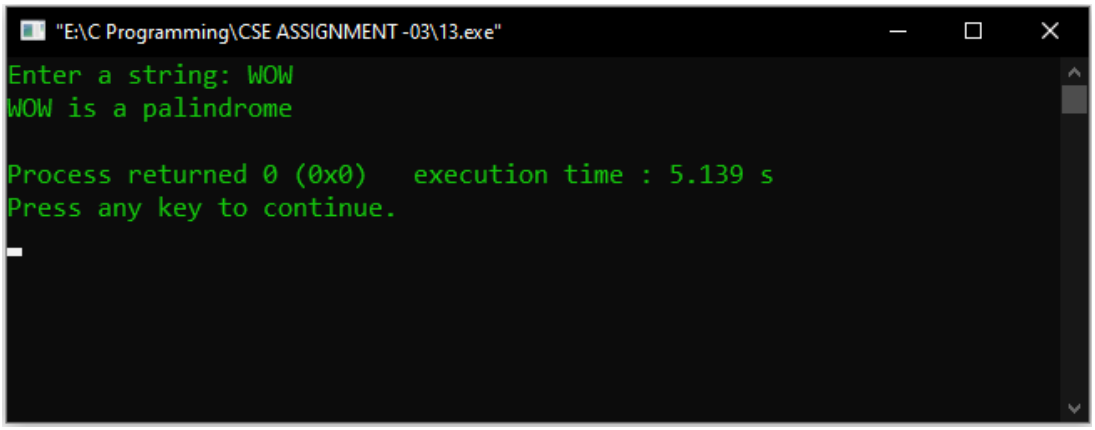
Problem- 13 :

➢ C program for check a string palindrome or not

CODE :

```
#include <stdio.h>
#include <string.h>

int main(){
   char string1[20];
   int i, length;
   int flag = 0;

   printf("Enter a string:");
   scanf("%s", string1);

   length = strlen(string1);

   for(i=0;i < length ;i++){
      if(string1[i] != string1[length-i-1]){
         flag = 1;
         break;
        }
      }

   if (flag) {
      printf("%s is not a palindrome", string1);
   }
   else {
      printf("%s is a palindrome\n", string1);
   }
   return 0;
}
```

RESULT :



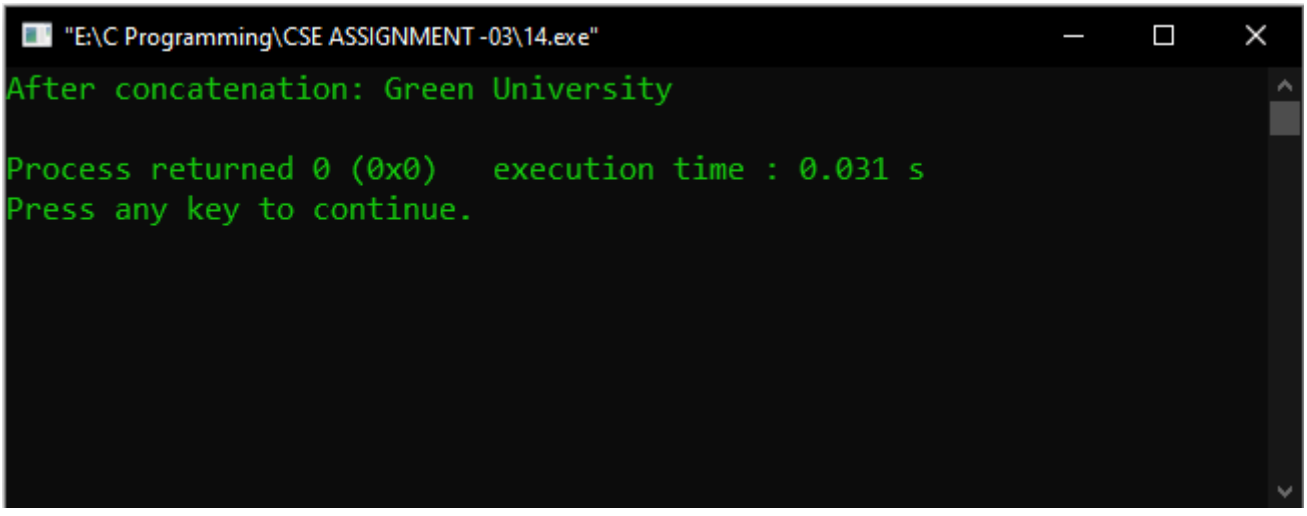
Problem- 14 :

➢ C program for concatenate string without strcat( ).

CODE :

```
#include <stdio.h>
int main() {
  char s1[100] = "Green ", s2[] = "University";
  int length, j;

  // store length of s1 in the length variable
  length = 0;
  while (s1[length] != '\0') {
    ++length;
  }

  // concatenate s2 to s1
  for (j = 0; s2[j] != '\0'; ++j, ++length) {
    s1[length] = s2[j];
  }


  s1[length] = '\0';

  printf("After concatenation: ");
  puts(s1);

  return 0;
}
```

RESULT :



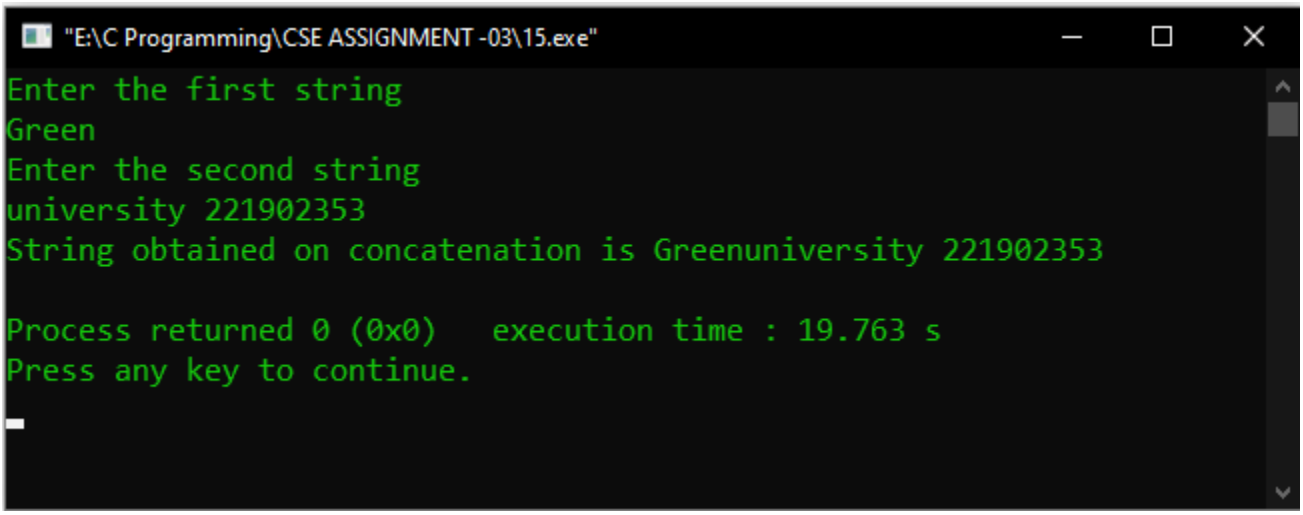
Problem- 15 :

➢ C program for concatenate string using strcat( ).

CODE :

```
#include <stdio.h>
#include <string.h>

int main()
{
   char a[100], b[100];

   printf("Enter the first string\n");
   gets(a);

   printf("Enter the second string\n");
   gets(b);

   strcat(a,b);

   printf("String obtained on concatenation is %s\n",a);

   return 0;

}
```

RESULT :



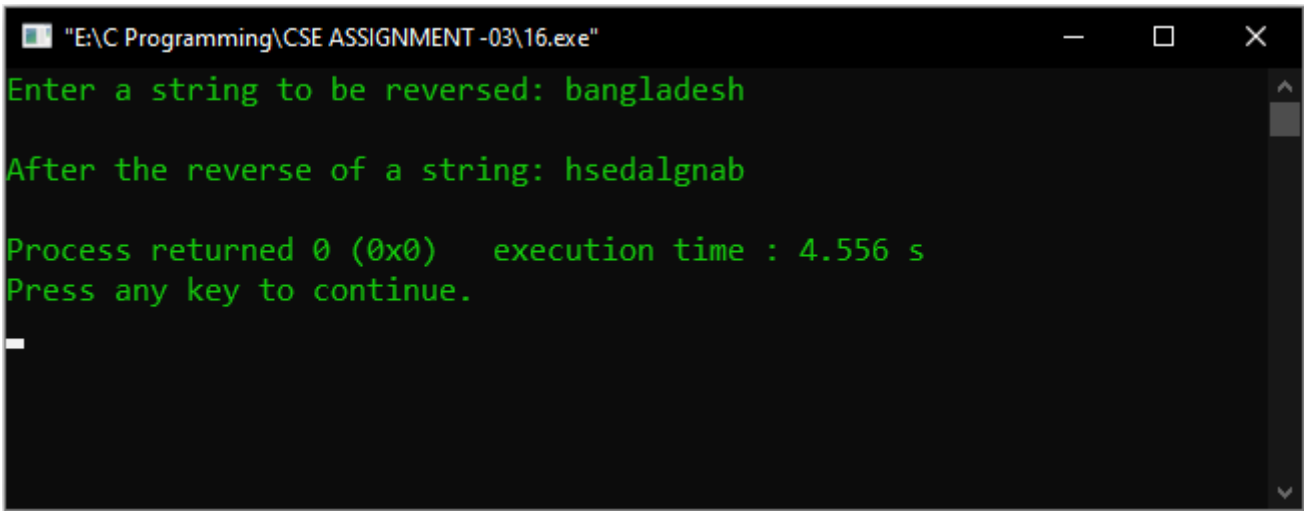
Problem- 16 :

➢ C program for reverse a string

CODE :

```
#include <stdio.h>
#include <string.h>
int main()
{
   char str[40]; // declare the size of character string
   printf ("Enter a string to be reversed: ");
   scanf ("%s", str);

   // use strrev() function to reverse a string
   printf (" \nAfter the reverse of a string: %s \n", strrev(str));
   return 0;
}
```

RESULT :



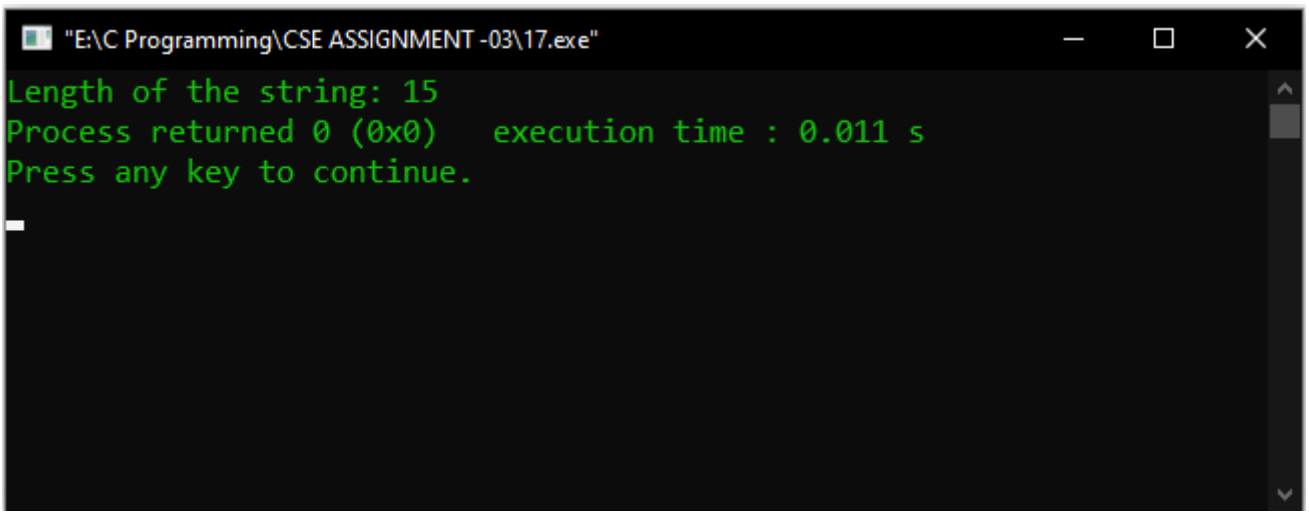
Problem- 17 :

➢ C program for find the Length of a String

CODE :

```
#include <stdio.h>
int main() {
   char s[] = "Chittagong city";
   int i;

   for (i = 0; s[i] != '\0'; ++i);

   printf("Length of the string: %d", i);
   return 0;
}
```

RESULT :



Problem- 18 :

➢ C program for check inputted character is vowel or consonant

CODE :

```
#include<stdio.h>
#include<conio.h>
int main()
{
   char ch;
   printf("Enter an Alphabet: ");
   scanf("%c", &ch);
   if(ch=='a' || ch=='e' || ch=='i' || ch=='o' || ch=='u')
      printf("\nIt's a Vowel");
   else if(ch=='A' || ch=='E' || ch=='I' || ch=='O' || ch=='U')
      printf("\nIt's a Vowel");
   else
      printf("\nIt's a Consonant");
   getch();
   return 0;
}
```

RESULT :