VISVESVARAYA TECHNOLOGICAL UNIVERSITY

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C PROGRAMMING LAB RECORD

Submitted by

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Under the Guidance of
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in partial fulfillment for the award of the degree of
BACHELOR OF ENGINEERING
in
COMPUTER SCIENCE AND ENGINEERING

B.M.S. COLLEGE OF ENGINEERING
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B.M.S. COLLEGE OF ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

DECALARATION

I, Nithin BS, student of 2nd Semester, B.E, Department of Computer Science and Engineering, B. M. S. College of Engineering, Bangalore, hereby declare that, this laboratory work for "C Programming" course has been carried out by us under the guidance of Prof. Rekha G S, Assistant Professor, Department of CSE, B. M. S. College of Engineering, Bangalore during the academic semester April-2021-June-2021

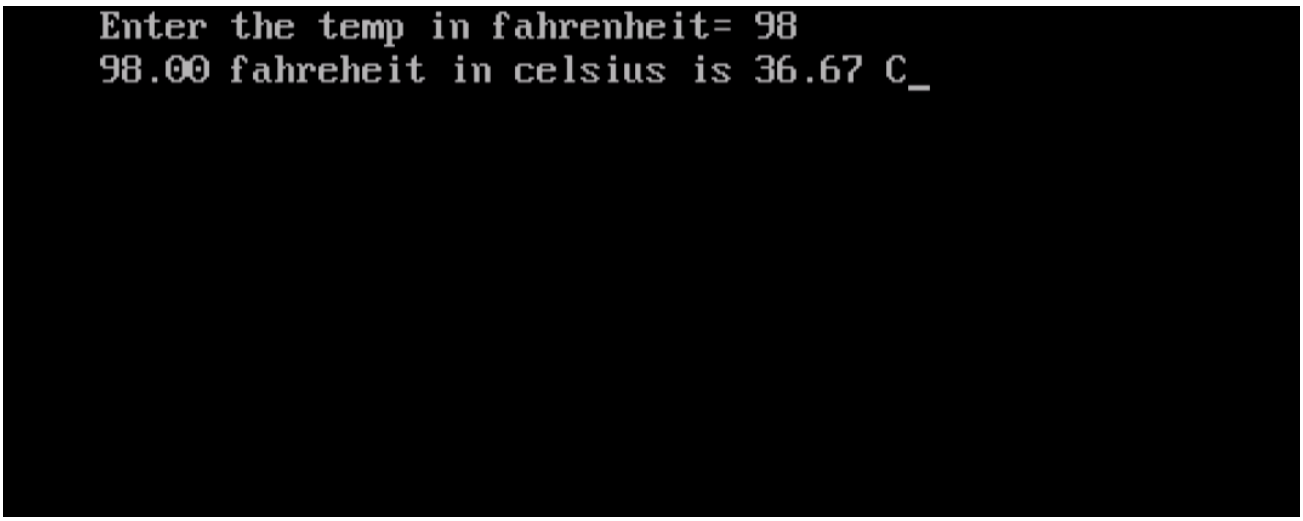
We also declare that to the best of our knowledge and belief, the development reported here is not from part of any other report by any other students.

NITHIN BS (1BM20CS100)

Q1) Develop a C program to convert degrees Fahrenheit into degrees celsius.

```
#include<stdio.h>
#include<conio.h>
void main()
{
float fah,cel;
printf("Enter the temp in fahrenheit= ");
scanf("%f",&fah);
cel=(5.0/9)*(fah-32);
printf("%.2f fahreheit in celsius is %.2f C", fah, cel);
getch();
}
```

Q1 OUTPUT:

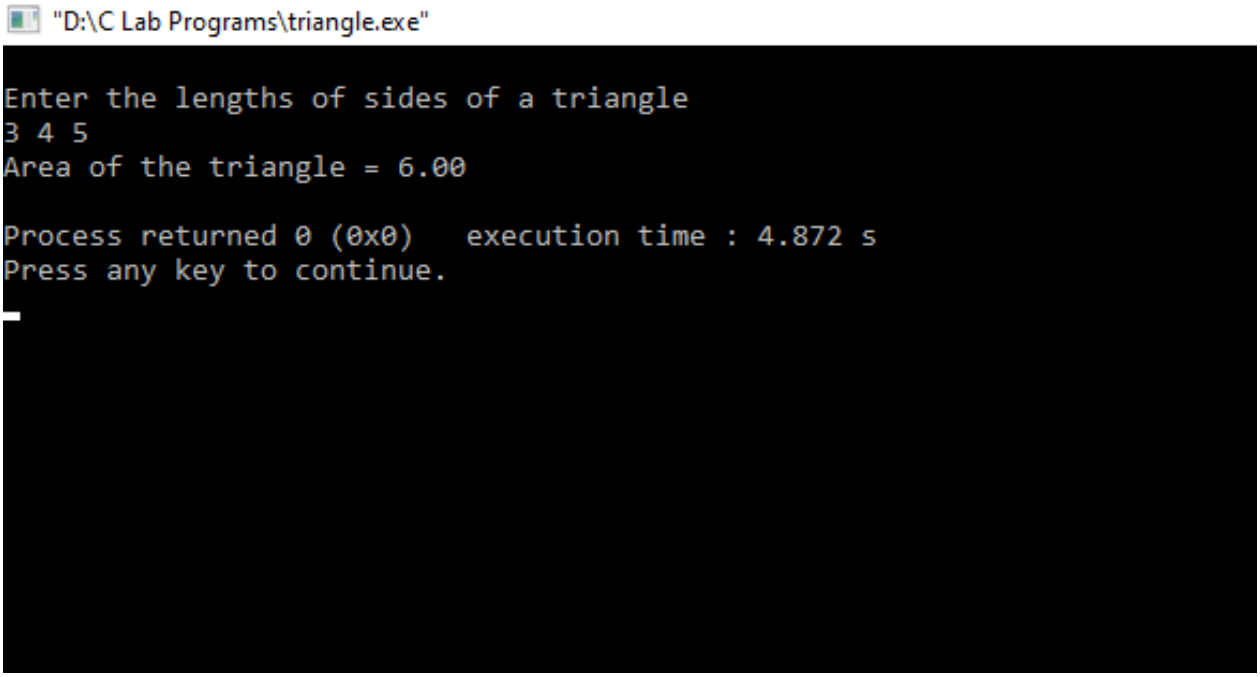

Enter the temp in fahrenheit= 98
98.00 fahreheit in celsius is 36.67 C_

Q2) Develop a C program to find the area of a triangle given its sides as input using functions.

```
#include <stdio.h>
#include <conio.h>
#include <math.h>
float ar(float a, float b, float c);
int main()
{
  float a, b, c, area;
  printf("\nEnter the lengths of sides of a triangle \n");
  scanf("%f%f%f", &a, &b, &c);
  area = ar(a, b, c);
  printf("Area of the triangle = %.2f\n", area);
  return 0;
  getch();
}

float ar(float a, float b, float c)
{
  float s, area;
  s = (a+b+c)/2;
  area = sqrt(s*(s-a)*(s-b)*(s-c));
  return area;
}
```

Q2 OUTPUT:


"D:\C Lab Programs\triangle.exe"
Enter the lengths of sides of a triangle
3 4 5
Area of the triangle = 6.00
Process returned 0 (0x0)   execution time : 4.872 s
Press any key to continue.

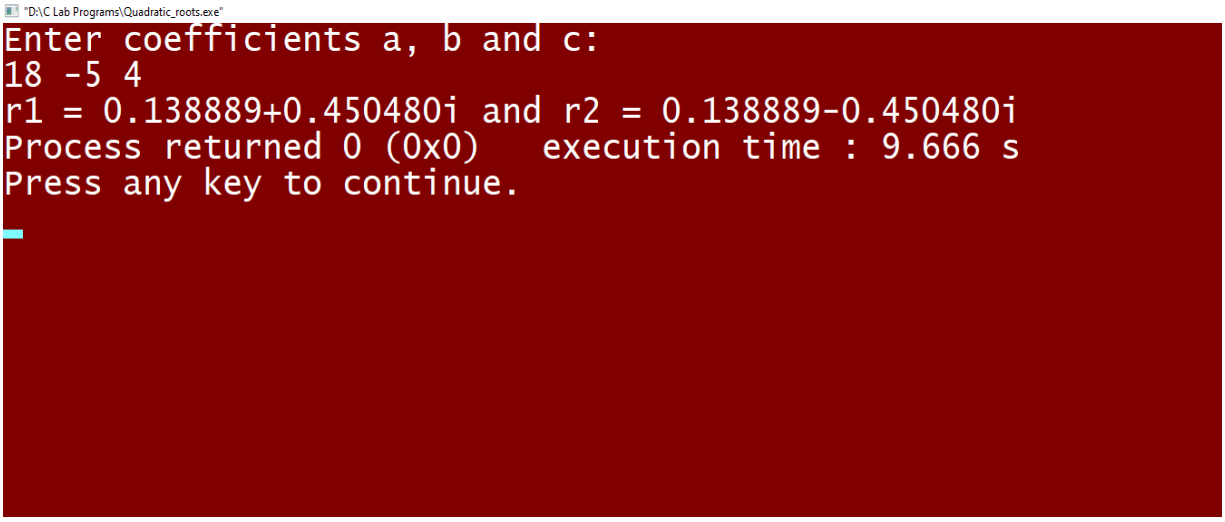
Q3) Develop a C program to find all possible roots of a quadratic equation.

```
#include <math.h>
#include <conio.h>
#include <stdio.h>
int main()
{
   float a, b, c, discriminant, r1, r2, realPart, imagPart;
   printf("Enter coefficients a, b and c:\n");
   scanf("%f %f %f", &a, &b, &c);

   discriminant = b*b - 4*a*c;
   if (discriminant > 0) {
      r1 = (-b + sqrt(discriminant))/(2*a);
      r2 = (-b - sqrt(discriminant))/(2*a);
      printf("root1 = %f and root2 = %f", r1, r2);
   }
   else if (discriminant == 0) {
      r1 = r2 = -b / (2 * a);
      printf("root1 = root2 = %f;", r1);
   }
   else {
      realPart = -b / (2 * a);
      imagPart = sqrt(-discriminant)/(2*a);
      printf("r1 = %f+%fi and r2 = %f-%fi", realPart, imagPart, realPart, imagPart);
   }

   return 0;
   getch();
}
```

Q3 OUTPUT:

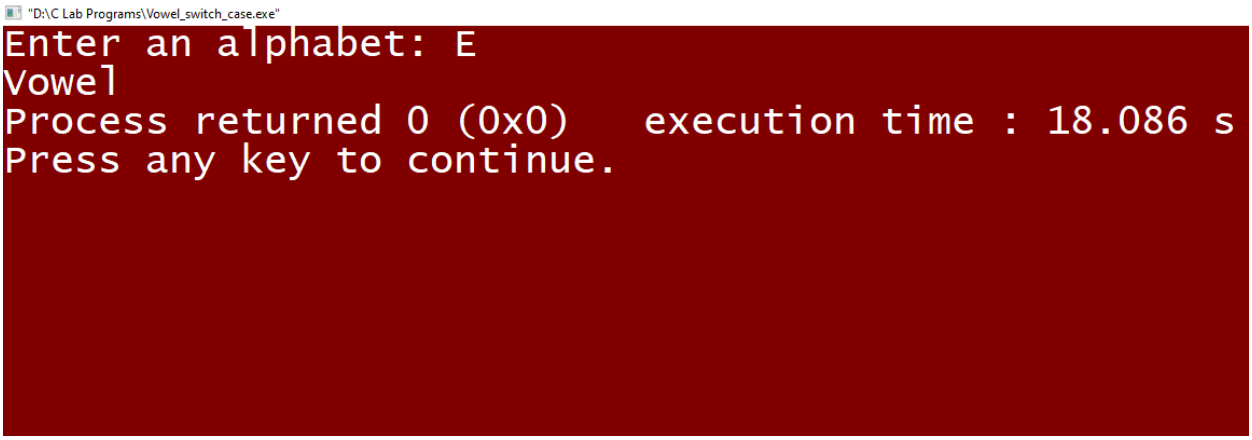

"D:\C Lab Programs\Quadratic_roots.exe"
Enter coefficients a, b and c:
18 -5 4
r1 = 0.138889+0.450480i and r2 = 0.138889-0.450480i
Process returned 0 (0x0)   execution time : 9.666 s
Press any key to continue.

Q4) Develop a C program to determine whether the entered character is a vowel or consonant using switch case statement.

```
#include <stdio.h>
int main()
{
   char ch;
   printf("Enter an alphabet: ");
   scanf("%c", &ch);
   switch(ch)
   {
      case 'a':
         printf("Vowel");
         break;
      case 'e':
         printf("Vowel");
         break;
      case 'i':
         printf("Vowel");
         break;
      case 'o':
         printf("Vowel");
         break;
```

```
        case 'u':
            printf("Vowel");
            break;
        case 'A':
            printf("Vowel");
            break;
        case 'E':
            printf("Vowel");
            break;
        case 'I':
            printf("Vowel");
            break;
        case 'O':
            printf("Vowel");
            break;
        case 'U':
            printf("Vowel");
            break;
        default:
            printf("Consonant");
    }
    return 0;
}
```

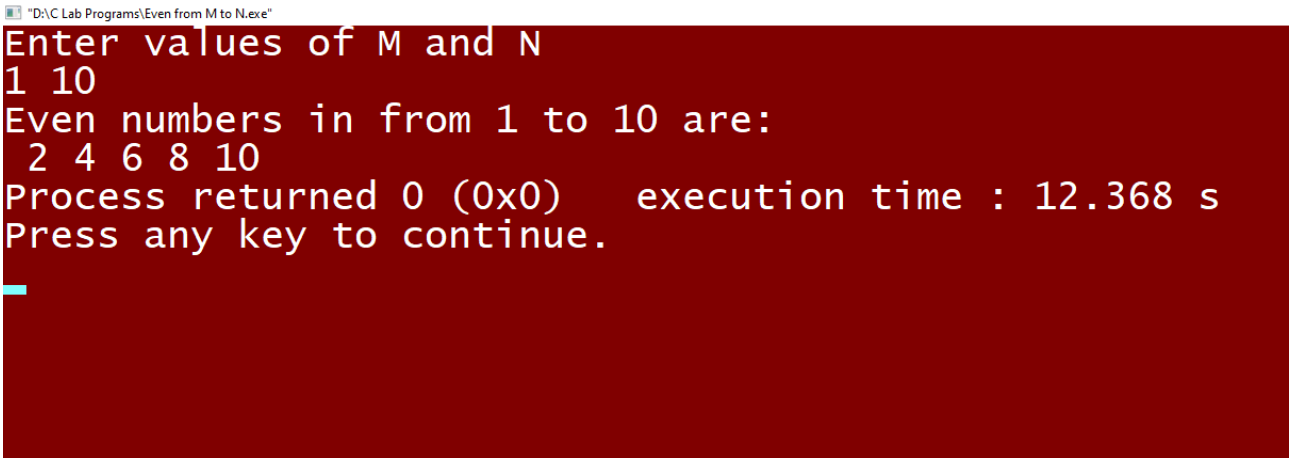
Q4 OUTPUT:


"D:\C Lab Programs\Vowel_switch_case.exe"
Enter an alphabet: E
Vowel
Process returned 0 (0x0)   execution time : 18.086 s
Press any key to continue.

Q5) Develop a C program to print even numbers from M to N.

```
#include <stdio.h>
int main()
{
   int i,M,N;
   printf("Enter values of M and N\n");
   scanf("%d %d", &M,&N);
   printf("Even numbers in from %d to %d are:\n", M, N);
   for (int i = M%2==0 ? M : M+1; i <= N; i+=2)
      {
       printf("%d", i);
       }
       return 0;
}
```

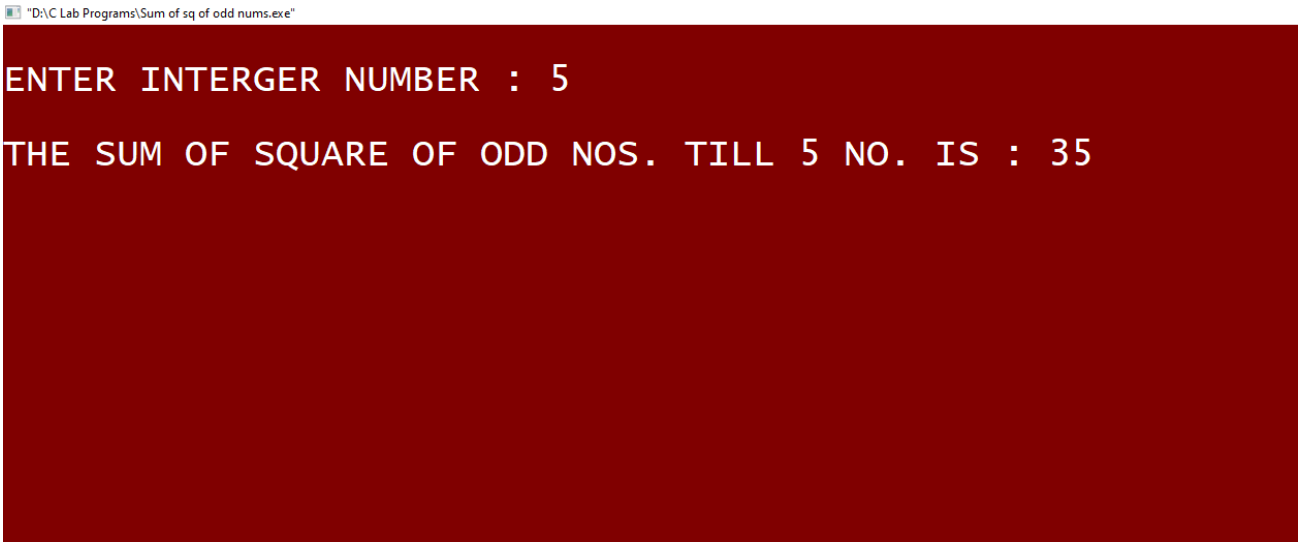
Q5 OUTPUT:


"D:\C Lab Programs\Even from M to N.exe"
Enter values of M and N
1 10
Even numbers in from 1 to 10 are:
2 4 6 8 10
Process returned 0 (0x0) execution time : 12.368 s
Press any key to continue.

Q6) Develop a program to calculate the sum of squares of first n odd numbers.

```
#include<stdio.h>
void main()
{
int NUM,i,j,SUM=0;
printf("\nENTER INTERGER NUMBER : ");
scanf("%d",&NUM);
for(i=1;i<NUM+1;i++)
{
if(i%2!=0)
{
SUM=SUM+(i*i);
}
}
printf("\nTHE SUM OF SQUARE OF ODD NOS. TILL
%d NO. IS : %d",NUM,SUM);
getch();
}
```

Q6 OUTPUT:


"D:\C Lab Programs\Sum of sq of odd nums.exe"
ENTER INTERGER NUMBER : 5
THE SUM OF SQUARE OF ODD NOS. TILL 5 NO. IS : 35

Q7) Develop a program to perform addition of two Matrices.

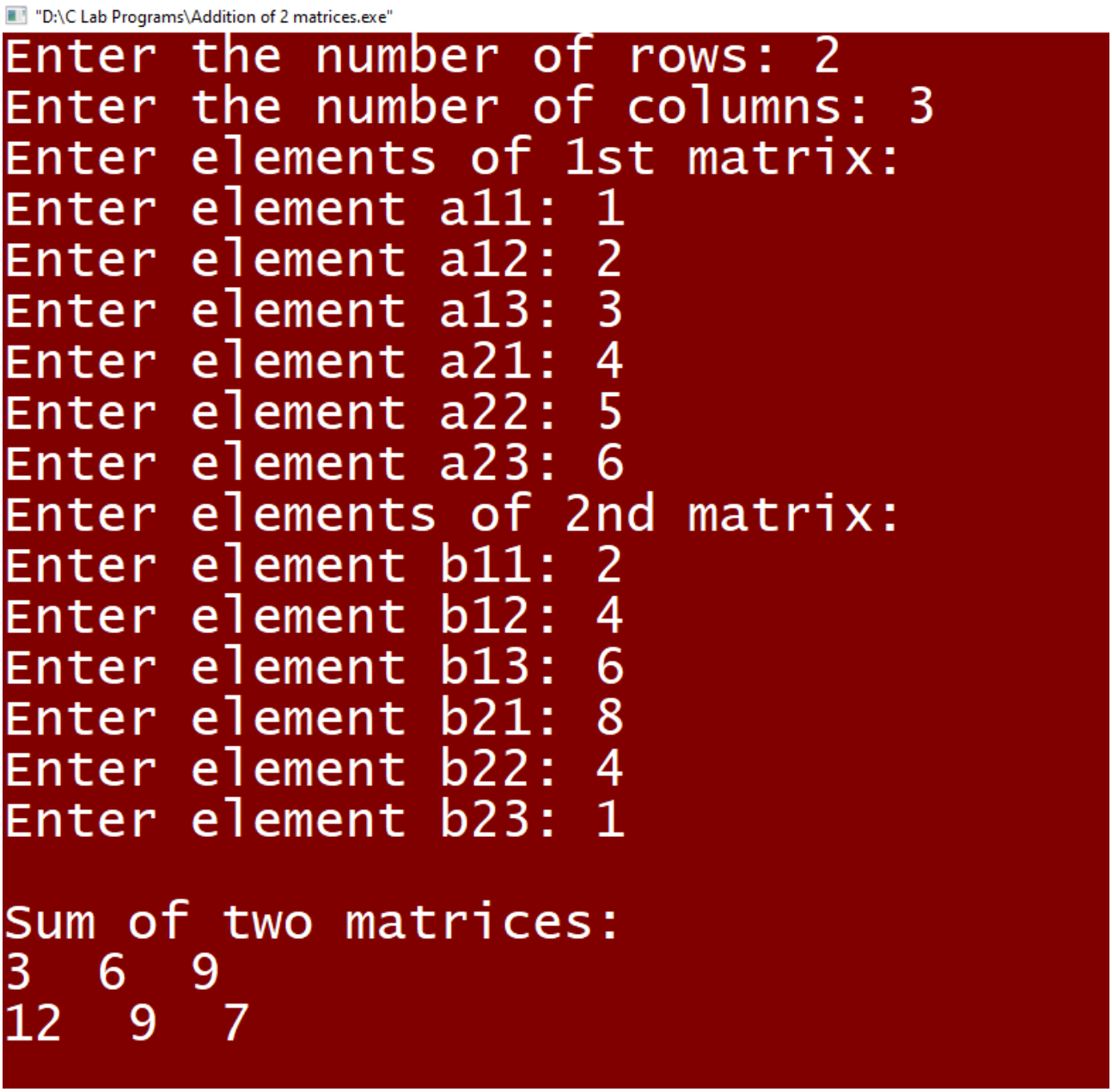
```
#include <stdio.h>
int main()
{
  int r, c, a[10][10], b[10][10], sum[10][10], i, j;
  printf("Enter the number of rows: ");
  scanf("%d", &r);
  printf("Enter the number of columns: ");
  scanf("%d", &c);

  printf("Enter elements of 1st matrix:\n");
  for (i=0; i<r; ++i)
    for (j=0; j<c; ++j)
       {
     printf("Enter element a%d%d: ", i + 1, j + 1);
     scanf("%d", &a[i][j]);
    }
  printf("Enter elements of 2nd matrix:\n");
  for (i=0; i<r; ++i)
    for (j=0; j<c; ++j)
       {
     printf("Enter element b%d%d: ", i + 1, j + 1);
```

```
      scanf("%d", &b[i][j]);
    }
  for (i=0; i<r; ++i)
    for (j=0; j<c; ++j)
       {
      sum[i][j] = a[i][j] + b[i][j];
    }
  printf("\nSum of two matrices: \n");
  for (i=0; i<r; ++i)
    for (j=0; j<c; ++j)
       {
      printf("%d  ", sum[i][j]);
      if (j==c-1)
       {
       printf("\n");
      }
    }

  return 0;
}
```

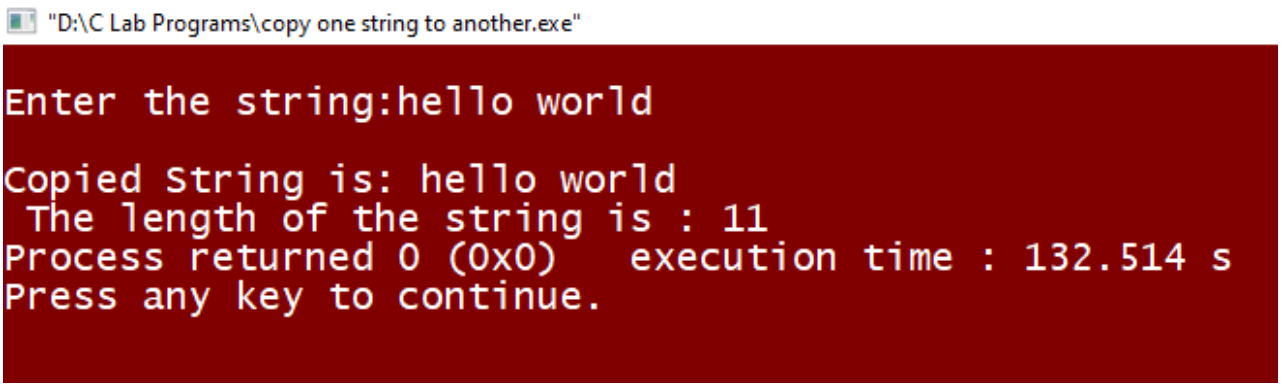
Q7 OUTPUT:


"D:\C Lab Programs\Addition of 2 matrices.exe"
Enter the number of rows: 2
Enter the number of columns: 3
Enter elements of 1st matrix:
Enter element a11: 1
Enter element a12: 2
Enter element a13: 3
Enter element a21: 4
Enter element a22: 5
Enter element a23: 6
Enter elements of 2nd matrix:
Enter element b11: 2
Enter element b12: 4
Enter element b13: 6
Enter element b21: 8
Enter element b22: 4
Enter element b23: 1
Sum of two matrices:
3 6 9
12 9 7

Q8) Develop a C program to copy one string to another string and find its length without using built in functions.

```
#include<stdio.h>
 int main()
 {
   char s1[100], s2[100];
   int i=0, length;
   printf("\nEnter the string:");
   gets(s1);
   while (s1[i] != '\0')
    {
      s2[i] = s1[i];
      i++;
   }
   s2[i] = '\0';
   printf("\nCopied String is: %s ", s2);
   while(s2[i] != '\0')
    i++;
   length = i;
   printf("\n The length of the string is : %d", length);
   return 0;
}
```

Q8 OUTPUT:

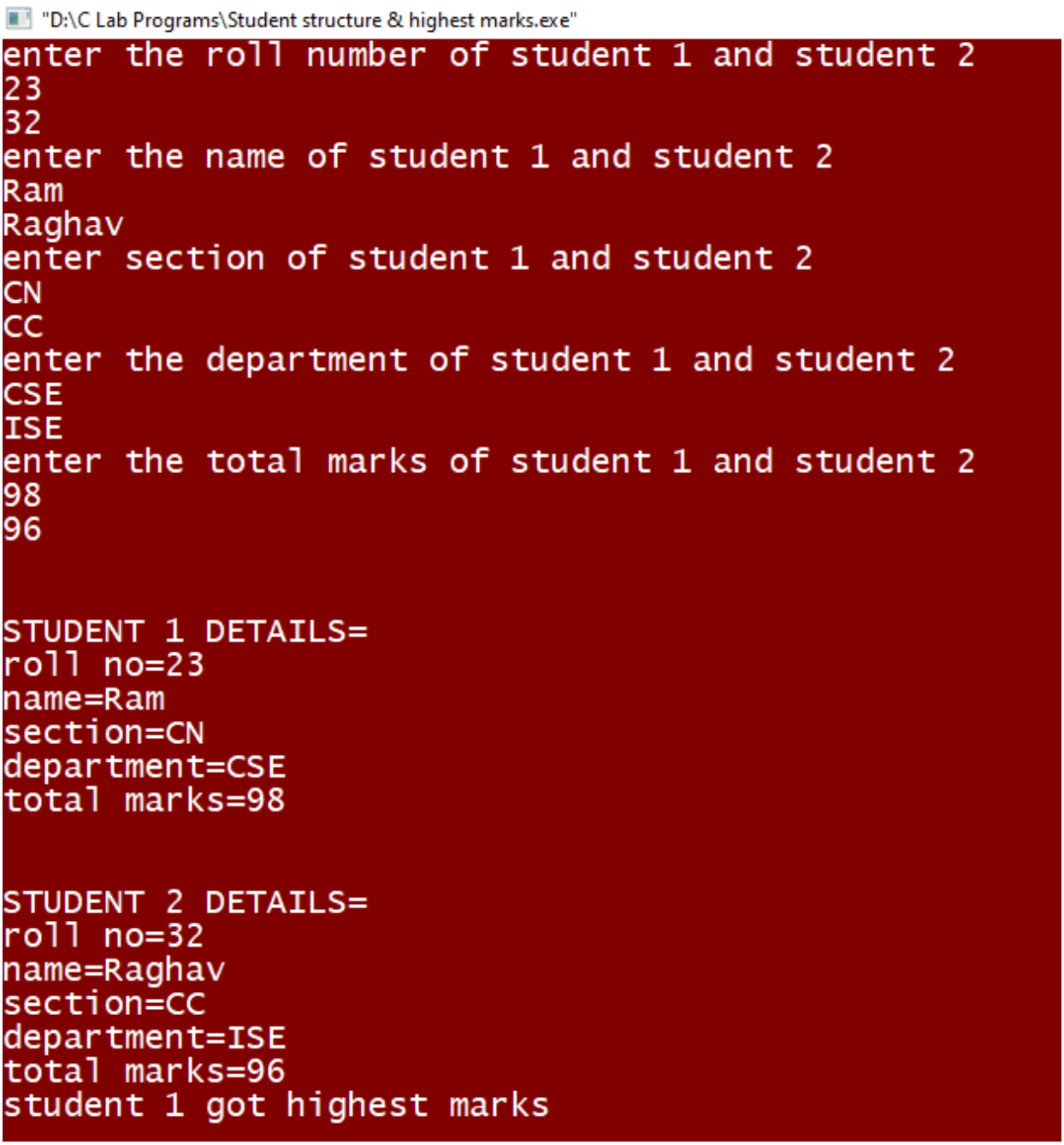

"D:\C Lab Programs\copy one string to another.exe"
Enter the string:hello world
Copied String is: hello world
The length of the string is : 11
Process returned 0 (0x0) execution time : 132.514 s
Press any key to continue.

Q9) Develop a C program to create student structure, read two student details (Student roll number, name, section, department, fees, and results i.e., total marks obtained) and print the student details who has scored the highest.

```
#include<stdio.h>
void main()
{
   struct student
   {
      int rollno;
      char name[20];
      char sec[3];
      char dept[20];
      int totalmarks;
   }student1,student2;
   printf("enter the roll number of student 1 and student 2\n");
   scanf("%d%d",&student1.rollno,&student2.rollno);
   printf("enter the name of student 1 and student 2\n");
   scanf("%s%s",student1.name,student2.name);
   printf("enter section of student 1 and student 2\n");
   scanf("%s%s",student1.sec,student2.sec);
   printf("enter the department of student 1 and student 2\n");
   scanf("%s%s",student1.dept,student2.dept);
   printf("enter the total marks of student 1 and student 2\n");
```

```
    scanf("%d%d",&student1.totalmarks,&student2.totalmarks);
    printf("\n\nSTUDENT 1 DETAILS=\n");
    printf("roll no=%d\n",student1.rollno);
    printf("name=%s\n",student1.name);
    printf("section=%s\n",student1.sec);
    printf("department=%s\n",student1.dept);
    printf("total marks=%d\n",student1.totalmarks);
    printf("\n\nSTUDENT 2 DETAILS=\n");
    printf("roll no=%d\n",student2.rollno);
    printf("name=%s\n",student2.name);
    printf("section=%s\n",student2.sec);
    printf("department=%s\n",student2.dept);
    printf("total marks=%d\n",student2.totalmarks);
    if(student1.totalmarks>student2.totalmarks)
    {
       printf("student 1 got highest marks\n");
    }
    else
    {
       printf("student 2 got highest marks\n");
    }
}
```

Q9 OUTPUT:


"D:\C Lab Programs\Student structure & highest marks.exe"
enter the roll number of student 1 and student 2
23
32
enter the name of student 1 and student 2
Ram
Raghav
enter section of student 1 and student 2
CN
CC
enter the department of student 1 and student 2
CSE
ISE
enter the total marks of student 1 and student 2
98
96
STUDENT 1 DETAILS=
roll no=23
name=Ram
section=CN
department=CSE
total marks=98
STUDENT 2 DETAILS=
roll no=32
name=Raghav
section=CC
department=ISE
total marks=96
student 1 got highest marks

Q10) Develop a C program to perform arithmetic operations (addition, subtraction, multiplication, division and remainder) on two integers using pointers.

```
#include<stdio.h>
int operations(int *, int *, int *, int *, int*, float
*, int *);
int main()
{
int a,b;
int add,sub,multiplication,rem;
float division;
printf("Enter the two numbers operations: ");
scanf("%d %d",&a,&b);
operations(&a, &b, &add, &sub, &multiplication,&division,
&rem);
printf("Addition :%d\n",add);
printf("Subtraction :%d\n",sub);
printf("Division :%0.2f\n",division);
printf("Multiplication :%d\n",multiplication);
printf("Remainder :%d\n",rem);
return 0;
}
int operations(int *a, int *b, int *add, int *sub, int
*multiplication, float *division, int *rem)
```

```
{
*add=*a+*b;
*sub=*a-*b;
*multiplication=*a**b;
*division=(float)(*a)/(*b);
*rem=(*a)%(*b);
return 0;
}
```

Q10 OUTPUT:

```
Enter the two numbers operations: 5 4
Addition :9
Subtraction :1
Division :1.25
Multiplication :20
Remainder :1

Process returned 0 (0x0)   execution time : 36.548 s
Press any key to continue.
```