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, ROHIT KUMAR 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.

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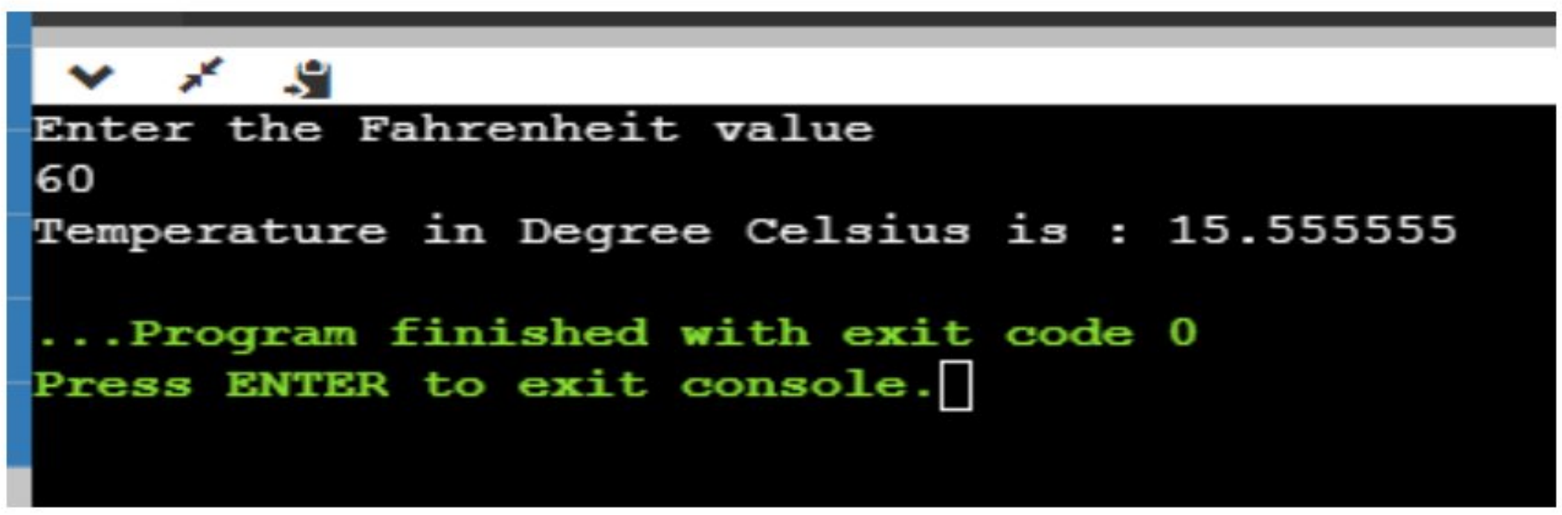
PROGRAM 1

Develop a C program to convert degrees Fahrenheit into degrees Celsius.

Code:

```
#include<stdio.h>
int main ()
{
        float Fahrenheit, Celsius;
        //Read the value of Fahrenheit from the user at runtime
        printf ("Enter the Fahrenheit value\n");
        scanf ("%f", &Fahrenheit);
        Celsius = ((Fahrenheit-32) *5)/9;
        printf ("Temperature in Degree Celsius is: %f", Celsius);
        return 0;
}
```

Output:



PROGRAM 2

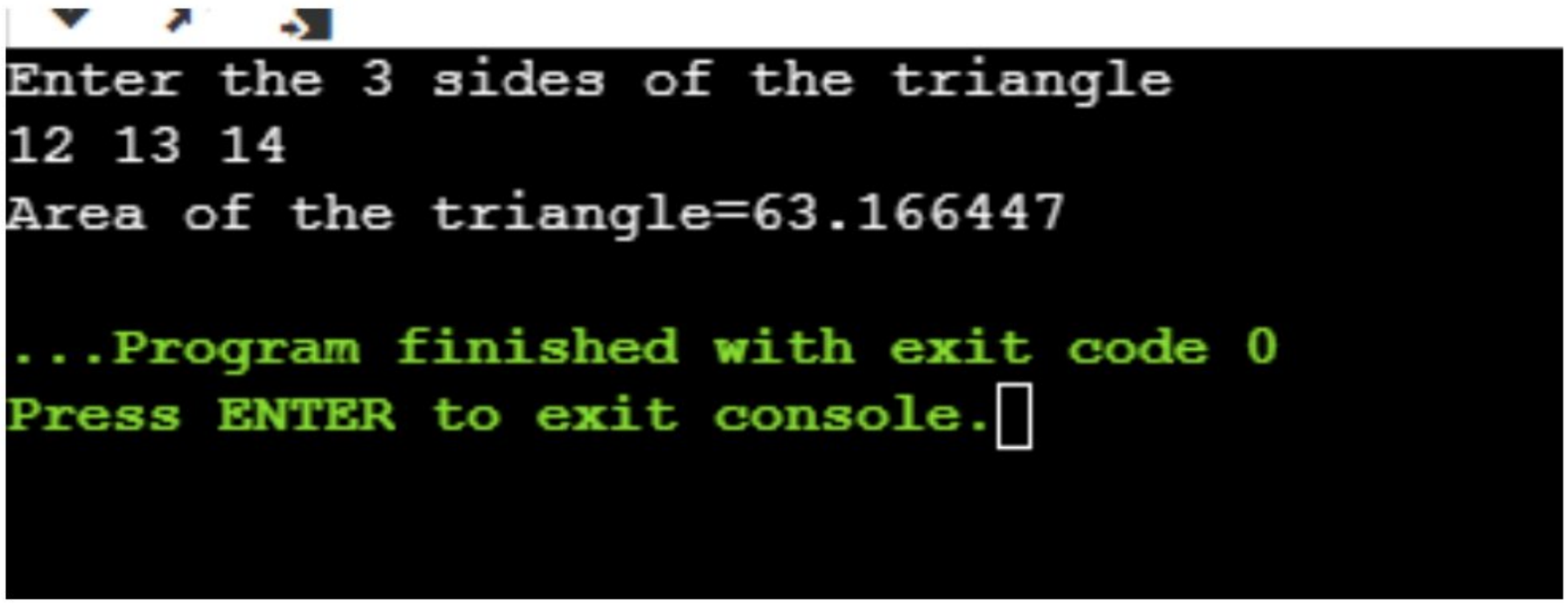
Develop a C program to find the area of a triangle given its sides as input using functions.

Code:

```
#include <stdio.h>
#include<math.h>
float area_triangle(int a, int b, int c)
{
    float s, area;
    s=(a+b+c)/2; //s is called the semi perimeter
    area= sqrt(s*(s-a)*(s-b)*(s-c));
    return area;
}

int main()
{
    float side1, side2, side3,result;
    printf("Enter the 3 sides of the triangle\n");
    scanf("%f %f %f",&side1, &side2, &side3);
    result=area_triangle(side1, side2, side3); //Function call
    printf("Area of the triangle=%f", result);
    return 0;
}
```

Output:



PROGRAM 3:

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

```
#include <math.h>
#include <stdio.h>
int main() {
    double a, b, c, discriminant, root1, root2, realPart, imagPart;
    printf("Enter coefficients a, b and c: ");
    scanf("%lf %lf %lf", &a, &b, &c);

    discriminant = b * b - 4 * a * c;

    // condition for real and different roots
    if (discriminant > 0) {
        root1 = (-b + sqrt(discriminant)) / (2 * a);
        root2 = (-b - sqrt(discriminant)) / (2 * a);
        printf("root1 = %.2lf and root2 = %.2lf\n", root1, root2);
        printf("Roots are real and distinct\n");
    }

    // condition for real and equal roots
    else if (discriminant == 0) {
        root1 = root2 = -b / (2 * a);
        printf("root1 = root2 = %.2lf\n", root1);
        printf("Roots are real and equal\n");
    }

    // if roots are not real
    else {
        realPart = -b / (2 * a);
        imagPart = sqrt(-discriminant) / (2 * a);
        printf("root1 = %.2lf+%.2lfi and root2 = %.2lf-%.2lfi\n", realPart, imagPart, realPart,
imagPart);
        printf("Roots are compelx\n");
    }
 return 0;
}
```

Output:

```
Enter coefficients a, b and c: 2 3 6
root1 = -0.75+1.56i and root2 = -0.75-1.56i
Roots are compelx


...Program finished with exit code 0
Press ENTER to exit console.
```

PROGRAM 4:

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;

/* Input an alphabet from user */
printf("Enter an alphabet: ");
scanf("%c", &ch);

/* Switch value of 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':
```

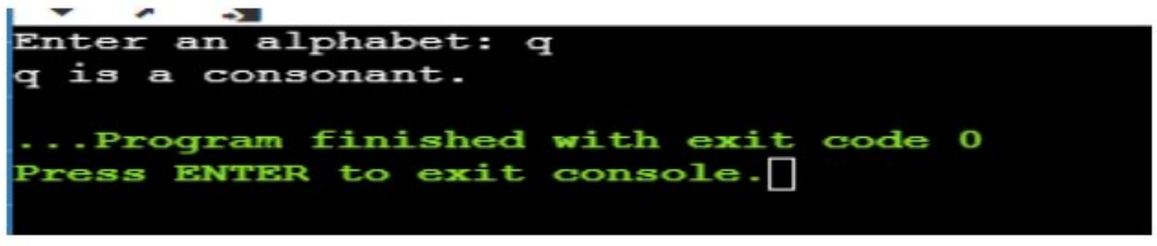
```
    printf("Vowel");
    break;
case 'A':
    printf("Vowel");
    break;
case 'E':
    printf("Vowel");
    break;
case 'I':
    printf("Vowel");
    break;
case 'O':
    printf("Vowel");
    break;
case 'U':
    printf("Vowel");
    break;
default:
    printf("Consonant");
}

return 0;

}

}
```

Output:



PROGRAM 5:

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

```
#include <stdio.h>

int main()
{
    int i, m, n;
    printf("Enter the lower limit m: ");
    scanf("%d", &m);
    printf("\nEnter the upper limit n: ");
    scanf("%d", &n);
    printf("\nAll even numbers from %d to %d are: \n",m, n);
    i=m;
    while(i<=n)
    {
       if(i%2==0)
       {
          printf("%d\n", i);
       }

       i++;
    }

    return 0;
}
```

Output:

```
Enter the lower limit m: 26

Enter the upper limit n: 38

All even numbers from 26 to 38 are:
26      28      30      32      34      36      38

...Program finished with exit code 0
Press ENTER to exit console.
```

Program 6:

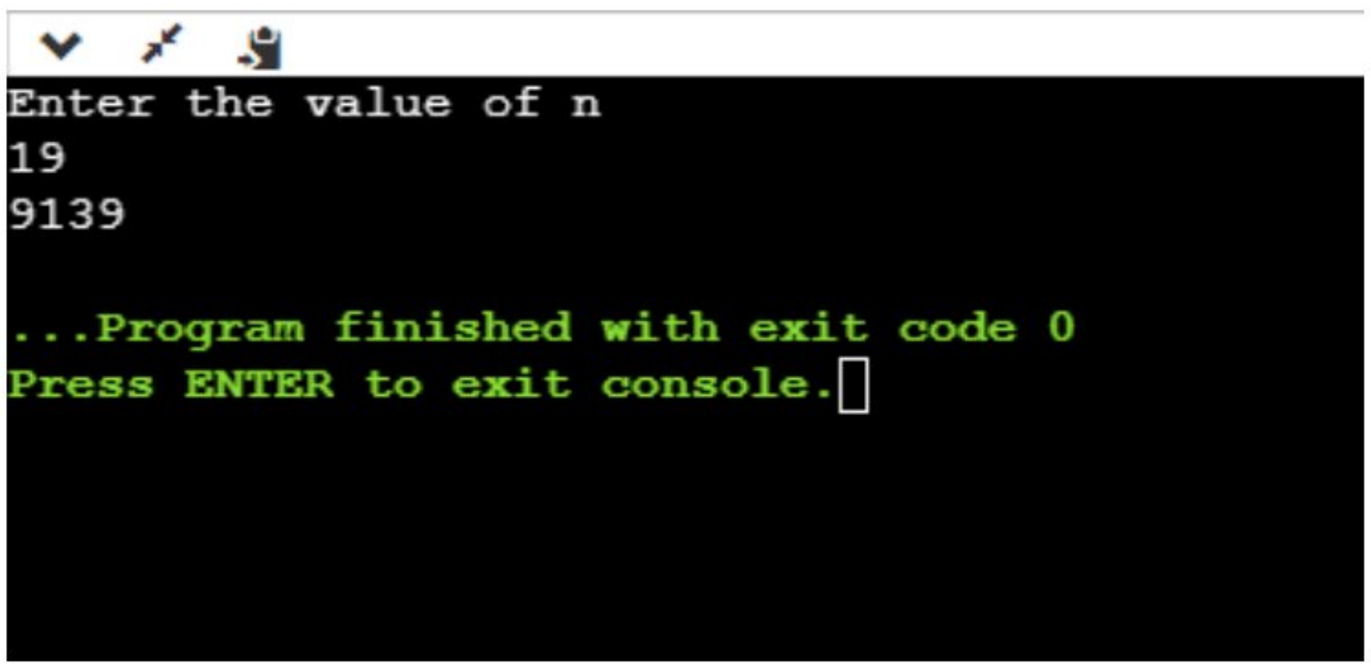
Develop a program to calculate the sum of squares of first n odd numbers.

```
#include <stdio.h>

 int squareSum(int n)
{
    int sum = 0;
    for (int i = 1; i <=  n; i++)
    {
        sum += (2*i - 1) * (2*i - 1);
    }
    return sum;
}

int main()
{
   int res,n;
   printf("Enter the value of n\n");
   scanf("%d", &n);
   res=squareSum(n);
   printf("%d", res);
   return 0;
}
```

Output:



PROGRAM 7:

Develop a program to perform addition of two Matrices.

```
#include <stdio.h>
#include<stdlib.h>
int main()
{
int i, j;
int rows1, cols1, rows2, cols2, rows_sum, cols_sum;
int mat1[5][5], mat2[5][5], sum[5][5];
printf("\n Enter the number of rows in the first matrix : ");
scanf("%d",&rows1);
printf("\n Enter the number of columns in the first matrix : ");
scanf("%d",&cols1);
printf("\n Enter the number of rows in the second matrix : ");
scanf("%d",&rows2);
printf("\n Enter the number of columns in the second matrix : ");
scanf("%d",&cols2);
if(rows1 != rows2 || cols1 != cols2)
{
printf("\n Number of rows and columns of both matrices must be equal");
exit(0);
}
rows_sum = rows1; //rows_sum = rows2;
cols_sum = cols1; //cols_sum = cols2;
printf("\n Enter the elements of the first matrix ");
for(i=0;i<rows1;i++)
{
```

```
for(j=0;j<cols1;j++)
{
scanf("%d",&mat1[i][j]);
}
}
printf("\n Enter the elements of the second matrix ");
for(i=0;i<rows2;i++)
{
for(j=0;j<cols2;j++)
{
scanf("%d",&mat2[i][j]);
}
}
for(i=0;i<rows_sum;i++)
{
for(j=0;j<cols_sum;j++)
sum[i][j] = mat1[i][j] + mat2[i][j];
}
printf("\n The elements of the resultant matrix are ");
for(i=0;i<rows_sum;i++)
{
printf("\n");
for(j=0;j<cols_sum;j++)
printf("\t %d", sum[i][j]);
}
return 0;
}
```

Output:

```
Enter the number of rows in the first matrix : 2

Enter the number of columns in the first matrix : 2

Enter the number of rows in the second matrix : 2

Enter the number of columns in the second matrix : 2

Enter the elements of the first matrix 12 13 14 15

Enter the elements of the second matrix 16 17 18 19

The elements of the resultant matrix are
        28      30
        32      34

...Program finished with exit code 0
Press ENTER to exit console.
```

PROGRAM 8:

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

Code:

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

```
int main() {
   char s1[100], s2[100];
   int i=0, length=0;

   printf("\nEnter the string :");
   gets(s1);

   i = 0;
   while (s1[i] != '\0') {
      s2[i] = s1[i];
      i++;
   }

   s2[i] = '\0';
   printf("\nCopied String is %s ", s2);

   i=0;
   while(s2[i]!='\0')
      i++;
    length=i;
    printf("\n The length of the string is : %d\n", length);

   return 0;
}
```

Output:

```
Enter the string :Good morning

Copied String is Good morning
 The length of the string is : 12


...Program finished with exit code 0
Press ENTER to exit console.
```

PROGRAM 9:

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.

Code:

```
#include<stdio.h>

struct student

{

    int roll_no;

    char name[20];

    char section[5];

    char dept[20];

    float fees;

    int marks;

};

int main()

{

    struct student stud1, stud2;

    printf("Enter Student 1 details:\n");

    printf("\nEnter the roll number:");

    scanf("%d",&stud1.roll_no);

    printf("\nEnter the name:");

    scanf("%s", stud1.name);

    printf("\nEnter the section:");

    scanf("%s",stud1.section);

    printf("\nEnter the Department:");

    scanf("%s",stud1.dept);

    printf("\nEnter the fees:");

    scanf("%f",&stud1.fees);
```

```
printf("\nEnter the marks:");
scanf("%d",&stud1.marks);

printf("Enter Student 2 details:\n");
printf("\nEnter the roll number:");
scanf("%d",&stud2.roll_no);
printf("\nEnter the name:");
scanf("%s", stud2.name);
printf("\nEnter the section:");
scanf("%s",stud2.section);
printf("\nEnter the Department:");
scanf("%s",stud2.dept);
printf("\nEnter the fees:");
scanf("%f",&stud2.fees);
printf("\nEnter the marks:");
scanf("%d",&stud2.marks);

if(stud1.marks>stud2.marks)
{
   printf("The details of the student who has scored highest marks is:\n");
   printf("\nRoll number=%d",stud1.roll_no);
   printf("\nName=%s",stud1.name);
   printf("\nSection=%s",stud1.section);
   printf("\nDepartment=%s",stud1.dept);
   printf("\nFees=%f",stud1.fees);
   printf("\nMarks obtained=%d",stud1.marks);
}
else
{
   printf("The details of the student who has scored highest marks is:");
```

```
    printf("\nRoll number=%d",stud2.roll_no);
    printf("\nName=%s",stud2.name);
    printf("\nSection=%s",stud2.section);
    printf("\nDepartment=%s",stud2.dept);
    printf("\nFees=%f",stud2.fees);
    printf("\nMarks obtained=%d",stud2.marks);
  }
  }
```

Output:

```
Enter Student 1 details:

Enter the roll number:12

Enter the name:Sneha

Enter the section:CL

Enter the Department:Chemical

Enter the fees:12000

Enter the marks:98
Enter Student 2 details:

Enter the roll number:11

Enter the name:Preesha

Enter the section:CN

Enter the Department:CSE

Enter the fees:12000

Enter the marks:99
The details of the student who has scored highest marks is:
Roll number=11
Name=Preesha
Section=CN
Department=CSE
Fees=12000.000000
Marks obtained=99

...Program finished with exit code 0
Press ENTER to exit console.
```

PROGRAM 10:

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

Code:

```
#include<stdio.h>

void addition( int *a, int *b, int *t) //Pass by reference or call by reference or pass by address

{

        *t = *a + *b;

}

void subtraction( int *d, int *e, int *s)

{

   *s=*d-*e;

}

void multiplication( int *f, int *g, int *m)

{

   *m=*f * *g;

}

void division( int *h, int *i, int *q)

{

   *q=*h / *i;

}

void reminder( int *j, int *k, int *r)

{

   *r=*j % *k;

}
```

```
int main()
{
        int num1, num2, sum, difference, multiply, quotient,rem;
        printf("\n Enter two numbers : ");
        scanf("%d %d", &num1, &num2);
        addition(&num1, &num2, &sum); //Function call
        subtraction(&num1, &num2, &difference);
        multiplication(&num1, &num2, &multiply);
        division(&num1, &num2, &quotient);
        reminder(&num1, &num2, &rem);
        printf("\nAddition of 2 numbers = %d", sum);
        printf("\nSubtraction of 2 numbers = %d", difference);
        printf("\nMultiplication of 2 numbers = %d", multiply);
        printf("\nQuotient after division of 2 numbers = %d", quotient);
        printf("\nRemainder after division of 2 numbers = %d", rem);

        return 0;
}
```

Output: