# VISVESVARAYA TECHNOLOGICAL UNIVERSITY

**"JnanaSangama", Belgaum -590014, Karnataka.**

## C PROGRAMMING LAB RECORD

***Submitted by***


**NEVYA KHANDELWAL (1BM20IS089)**


***Under the Guidance of***
**Prof. Rekha G S**
**Assistant Professor,**
**Department of CSE,**
**BMSCE**

***in partial fulfillment for the award of the degree of***
**BACHELOR OF ENGINEERING**
***in***
**INFORMATION 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, Nevya Khandelwal, student of 2nd Semester, B.E, Department of Information 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.

NEVYA KHANDELWAL (1BM20IS089)

(1.) Develop a C program to convert degrees Fahrenheit into degrees Celsius.

# CODE:

```
#include <stdio.h>
int main()
{
   float f;
   printf("Enter temperature in degree Fahrenheit :/n ");
   scanf("%f",&f);
   float c = (f-32)*5/9;
   printf("Temp in Celsius : %.2f°C\n",c);
}
```

# OUTPUT:

```
Enter the temperature in degree Fahrenheit
45
Temperature in Celsius :          7.22
```

(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>
int areacalculate(int a,int b,int c)
{
   float s , area , s1;
   s1=a+b+c;
   s = s1/2;
   area = sqrt(s*(s-a)*(s-b)*(s-c));
   printf("Area of Triangle of given sides is %0.2f",area);
   return 0;
}
int main()
{
   int a1,b1,c1;
   printf("Enter three side of triangle:\n");
   scanf("%d %d %d",&a1,&b1,&c1);
   areacalculate(a1,b1,c1);
   return 0;
}
```

OUTPUT:

```
Enter three sides of the triangle:
3 4 5
Area of Triangle of given sides is 6.00
```

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

# CODE:

```
#include <stdio.h>
#include <math.h>
void main()
{
   float a, b, c, det, root1, root2, real, img;
   printf("\n Enter the value of coefficient a, b and c: \n ");
   scanf("%f %f %f", &a, &b, &c);
   det = b * b - 4 * a * c;

   if (det > 0)
   {
   root1 = (-b + sqrt(det)) / (2 * a);
   root2 = (-b + sqrt(det)) / (2 * a);
   printf("\n Value of root1 = %.2f and Value of root2 = %.2f", root1, root2);
   }

   else if (det == 0)
   {
      root1 = root2 = -b / (2 * a);
      printf("\n Value of root1 = %.2f and Value of root2 = %.2f", root1, root2);
   }
      else
   {
      real = -b / (2 * a);
      img = sqrt(-det) / (2 * a);
      printf("\n Value of root1 = %.2f + %.2fi and Value of root2 = %.2f - %.2fi", real, img, real, img );
   }
}
```

# OUTPUT:

```
Enter the value of coefficient a, b and c:
5 8 9

Value of root1 = -0.80 + 1.08i and Value of root2 = -0.80 - 1.08i
```

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

## CODE:

```
#include <stdio.h>
int main()
{
   char ch;
   printf("Enter any alphabet: ");
   scanf("%c", &ch);

   switch(ch)
   {
      case 'a':
         printf("Entered charachter is a Vowel");
         break;
      case 'e':
         printf("Entered charachter is a Vowel");
         break;
      case 'i':
         printf("Entered charachter is a Vowel");
         break;
      case 'o':
         printf("Entered charachter is a Vowel");
         break;
      case 'u':
         printf("Entered charachter is a Vowel");
         break;
      case 'A':
         printf("Entered charachter is a Vowel");
         break;
      case 'E':
         printf("Entered charachter is a Vowel");
         break;
      case 'I':
         printf("Entered charachter is a Vowel");
         break;
      case 'O':
         printf("Entered charachter is a Vowel");
         break;
      case 'U':
         printf("Entered charachter is a Vowel");
         break;
      default:
         printf("Entered charachter is a Consonant");
   }

   return 0;
}
```

## OUTPUT:

```
Enter any alphabet: E
Entered charachter is a Vowel
```

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

CODE:

```
#include<stdio.h>
int evenr(int m,int n)
{
   int i;
   printf("Even Numbers from range %d-%d is: \n",m,n);
   if(m%2!=0)
   {
      m=2*m;
   }
      for(i=m;i<=n;i=i+2)
   {
      printf("%d",i);
      printf("\n");
   }
   return 0;
}
int main()
{
   int m,n;
   printf("Enter the Range M-N to print even numbers\n");
   scanf("%d %d",&m,&n);
   evenr(m,n);
   return 0;
}
```

OUTPUT:

```
Enter the Range M-N to print even numbers
8 16
Even Numbers from range 8-16 is:
8
10
12
14
16
```

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

CODE:

```
#include<stdio.h>
int square(int a)
{
   return (a*a);
}
   int squareodd(int n)
{
   int sumo=0;
   for(int i=1;i<=2*n;i++)
   {
      if(i%2!=0)
      {
         sumo=sumo+square(i);
      }
   }
   return sumo;
}
int main()
{
   int n,sumo;
   printf("Enter the value of N for which squares to be calculated: ");
   scanf("%d",&n);
   sumo=squareodd(n);
   printf("Sum of squares of first %d odd numbers :%d ",n,sumo);
   return 0;
}
```

OUTPUT:

```
Enter the value of N for which squares to be calculated: 20
Sum of squares of first 20 odd numbers :10660
```

(7.) Develop a program to perform addition of two Matrices.

CODE:

```
#include<stdio.h>
#include<stdlib.h>
int main()
{
   int mat1[10][10],mat2[10][10],mat3[10][10]={0},n1,m1,n2,m2,n3,m3;
   printf("Enter number of Rows in 1st matrix\n");
   scanf("%d",&n1);
   printf("Enter Number of columns in 1st matrix\n");
   scanf("%d",&m1);
   printf("Enter number of Rows in 2nd matrix\n");
   scanf("%d",&n2);
   printf("Enter Number of columns in 2nd matrix\n");
   scanf("%d",&m2);
   if(n1!=n2 && m1!=m2)
   {
      printf("Enter correct number of rows and columns");
      exit(0);
   }
   printf("Enter the elements of the matrix1\n");
   for(int i=0;i<n1;i++)
   {
      for(int j=0;j<m1;j++)
      {
         scanf("%d",&mat1[i][j]);
      }
   }
   printf("Enter the elements of the matrix2\n");
   for(int i=0;i<n2;i++)
   {
      for(int j=0;j<m2;j++)
      {
         scanf("%d",&mat2[i][j]);
      }
   }
   if(n1==n2 && m1==m2)
   {
      n3=n1;
      m3=m1;
      for(int i=0;i<n3;i++)
      {
         for(int j=0;j<m3;j++)
         {
            mat3[i][j]=mat1[i][j]+mat2[i][j];
         }
      }
      printf("Matrices sum is \n");
      for(int i=0;i<n3;i++)
     {
         printf("\n");
         for(int j=0;j<m3;j++)
         {
            printf("%d\t",mat3[i][j]);
         }
      }
   }
   return 0;
}
```

OUTPUT:

```
Enter number of Rows in 1st matrix
2
Enter Number of columns in 1st matrix
2
Enter number of Rows in 2nd matrix
2
Enter Number of columns in 2nd matrix
2
Enter the elements of the matrix1
2 4 6 8
Enter the elements of the matrix2
3 5 9 1
Matrices sum is

5       9
15      9
```

(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 len(char str[20])
{
   int i=0,count=0;
   while(str[i]!='\0')
   {
      count += 1;
      i++;
   }
   return count;
}
int main()
{
   char str1[20],str2[20];
   int i=0,j=0;
   printf("Enter the string to be copied\n");
   scanf("%s",str1);
   while(str1[i] != '\0')
   {
      str2[j]=str1[i];
      i++;
      j++;
   }
   str2[j]='\0';
   printf("Original string is %s\n",str1);
   printf("Copied string is %s\n",str2);
   printf("Length of the string is %d\n",len(str1));
   return 0;
}
```

OUTPUT:

```
Enter the string to be copied
CAR
Original string is CAR
Copied string is CAR
Length of the string is 3
```

## (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 rollno;
  char name[20];
  char sec[2];
  char dep[4];
  int fees;
  int result;
};
struct student getinfo();
void print(struct student s1);
int main()
{
    struct student s1,s2;
    printf("Enter details of 1st Student\n");
    s1 = getinfo();
    printf("Enter details of 2nd Student\n");
    s2 = getinfo();
    if(s1.result>s2.result)
    {
        print(s1);
    }
    else
    {
        print(s2);
    }
    return 0;
}
struct student getinfo()
{
    struct student s1;
    printf("Roll No. ");
    scanf("%d",&s1.rollno);
    printf("Name: ");
    scanf("%s",s1.name);
    printf("Section: ");
    scanf("%s",s1.sec);
    printf("Fees: ");
    scanf("%d",&s1.fees);
    printf("Result: ");
    scanf("%d",&s1.result);
    printf("Department: ");
    scanf("%s",s1.dep);

  return s1;
}
void print(struct student s1)
{
    printf("The details of student who got highest marks are as follows");
    printf("Roll No.: %d\n",s1.rollno);
    printf("Name: %s\n",s1.name);
    printf("Section: %s\n",s1.sec);
    printf("Department: %s\n",s1.dep);
    printf("Fees: %d\n",s1.fees);
    printf("Result = %d",s1.result);
}
```

# OUTPUT:

```
Enter details of 1st Student
Roll No. 8
Name: Jay
Section: A
Fees: 120000
Result: 90
Department: ISE
Enter details of 2nd Student
Roll No. 34
Name: Nyasa
Section: D
Fees: 200000
Result: 78
Department: CSE
The details of student who got highest marks are as followsRoll No.: 8
Name: Jay
Section: A
Department: ISE
Fees: 120000
Result = 90
```

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

CODE:

```
#include<stdio.h>
int ops(int *, int *, int *, int *, int*, float *, int *);
int main()
{
int a,b;
int add,sub,mul,rem;
float quo;
printf("Enter num 1: ");
scanf("%d",&a);
printf("Enter num 2: ");
scanf("%d",&b);
ops(&a, &b, &add, &sub, &mul, &quo, &rem);
printf("\n");
printf("Sum :%d\n",add);
printf("Difference :%d\n",sub);
printf("Quotient :%0.2f\n",quo);
printf("Product :%d\n",mul);
printf("Remainder :%d\n",rem);
}
int ops(int *a, int *b, int *add, int *sub, int *mul, float *quo, int *rem)
{
*add=*a+*b;
*sub=*a-*b;
*mul=*a**b;
*quo=(float)(*a)/(*b);
*rem=(*a)%(*b);
}
```

OUTPUT:

```
Enter num 1: 8
Enter num 2: 6

Sum :14
Difference :2
Quotient :1.33
Product :48
Remainder :2
```