VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belgaum -590014, Karnataka.

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
(Autonomous Institution under VTU)
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B.M.S. COLLEGE OF ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

DECALARATION

I,UTKARSH , 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.

UTKARSH (1BM20CS177)

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

```c
#include <stdio.h>

int main()
{
    float celsius, fahrenheit;


    printf("Enter temperature in Fahrenheit: ");
    scanf("%f", &fahrenheit);


    celsius = (fahrenheit - 32) * 5 / 9;


    printf("%.2f Fahrenheit = %.2f Celsius", fahrenheit, celsius);

    return 0;
}
```

```
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> gcc b.c
PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> .\a.exe
Enter temperature in Fahrenheit: 86
86.00 Fahrenheit = 30.00 Celsius
PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> []
```

OUTPUT 1

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

```c
#include <stdio.h>
#include <math.h>
double area_of_triangle(double, double, double);
int main()
{ double a, b, c, area;
  printf("Enter the lengths of sides of a triangle\n");
  scanf("%lf%lf%lf", &a, &b, &c);
  area = area_of_triangle(a, b, c);
  printf("Area of the triangle = %.2lf\n", area);
  return 0;
}
double area_of_triangle(double a, double b, double c)
{ double s, area;
 s = (a+b+c)/2;
 area = sqrt(s*(s-a)*(s-b)*(s-c));
return area;
}
```

```
Windows PowerShell
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PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> gcc b.c
PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> .\a.exe
Enter the lengths of sides of a triangle
5
6
8
Area of the triangle = 14.98
PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> 
```

OUTPUT 2

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

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

int main()
{
    float a, b, c;
    float root1, root2, imaginary;
    float discriminant;
    printf("Enter values of a, b, c of quadratic equation (aX^2 + bX + c): ");
    scanf("%f%f%f", &a, &b, &c);
    discriminant = (b * b) - (4 * a * c);
    if(discriminant > 0)
    { root1 = (-b + sqrt(discriminant)) / (2*a);
     root2 = (-b - sqrt(discriminant)) / (2*a);
       printf("Two distinct and real roots exists: %.2f and %.2f", root1, root2);
    }
    else if(discriminant == 0)
    {
     root1 = root2 = -b / (2 * a);
     printf("Two equal and real roots exists: %.2f and %.2f", root1, root2);
    }
    else if(discriminant < 0)
    {
    root1 = root2 = -b / (2 * a);
    imaginary = sqrt(-discriminant) / (2 * a);
 printf("Two distinct complex roots exists: %.2f + i%.2f and %.2f - i%.2f",
        root1, imaginary, root2, imaginary);
     }
       return 0;
}
```

OUTPUT 3:

```
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PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> gcc b.c
PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> .\a.exe
Enter values of a, b, c of quadratic equation (aX^2 + bX + c): 2 5 6
Two distinct complex roots exists: -1.25 + i1.20 and -1.25 - i1.20
PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> []
```

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

```c
#include <stdio.h>

int main()
{
    char ch;

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

    /* Switch ch value */
    switch(ch)
    {
        case 'a':
        case 'e':
        case 'i':
        case 'o':
        case 'u':
        case 'A':
        case 'E':
        case 'I':
        case 'O':
        case 'U':
            printf("Vowel");
            break;

        default: printf("Consonant");
    }

    return 0;
}
```

Output 4:


```
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PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> gcc b.c
PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> .\a.exe
Enter any character: H
Consonant
PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> gcc b.c
PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> .\a.exe
Enter any character: i
Vowel
PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> []
```

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

```c
#include<stdio.h>

int main(){

        int f1,f2,rem,i;

        printf("   Give the First number for the Range :   \n");

        scanf("%d",&f1);

        printf("   Give the Final number for the Range :   \n");

        scanf("%d",&f2);

        printf("\n The Even numbers between %d and %d are ",f1,f2);

        for(i=f1; i<=f2; ++i){

            rem = i % 2;

            if(rem == 0)

            printf("\n  %d",i);

        }

    return 0;

    }
```

OUTPUT 5:

```
   Give the First number for the Range :
10
   Give the Final number for the Range :
20

 The Even numbers between 10 and 20 are
  10
  12
  14
  16
  18
  20
PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> []
```

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

```c
#include <stdio.h>
int main()
{
 int n =0;
 printf("Enter an integer to get sum of squares : ");
   scanf("%d",&n);
   int sum = 0;
   for (int i = 1; i <= n; i++)
      sum += (2*i - 1) * (2*i - 1);
   printf("The sum of square of first %d odd numbers is %d",n, sum);
   return 0;
}
```

```
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> gcc b.c
PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> .\a.exe
Enter an integer to get sum of squares : 6
The sum of square of first 6 odd numbers is 286
PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> []
```

OUTPUT 6

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

```c
#include <stdio.h>
int main()
{
    int a[2][3],b[2][3],c[2][3],i,j;
    printf("\nENTER VALUES FOR MATRIX A:\n");
    for(i=0;i<2;i++)
        for(j=0;j<3;j++)
            scanf("%d",&a[i][j]);
    printf("\nENTER VALUES FOR MATRIX B:\n");
    for(i=0;i<2;i++)
        for(j=0;j<3;j++)
            scanf("%d",&b[i][j]);
    for(i=0;i<2;i++)
        for(j=0;j<3;j++)
            c[i][j]=a[i][j]+b[i][j];
    printf("\nTHE VALUES OF MATRIX C ARE:\n");
    for(i=0;i<2;i++)
        {
        for(j=0;j<3;j++)
            printf("%5d",c[i][j]);
        printf("\n");
    }
    return 0;
}
```

```
ENTER VALUES FOR MATRIX A:
2 5 6
4 9 7

ENTER VALUES FOR MATRIX B:
7 8 6
3 1 9

THE VALUES OF MATRIX C ARE:
    9   13   12
    7   10   16
PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> []
```

OUTPUT 7

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

```c
#include <stdio.h>
int main()
{
char s1[100] , s2[100], i;
printf("enter the string\n");
scanf("%s",s1);
int count=0;
for (i = 0; s1[i] != '\0'; ++i) {
count++;
s2[i] = s1[i];
}
s2[i] = '\0';
printf("String s2 : %s \n Size of string : %d", s2,count);
return 0;
}
```

```
Windows PowerShell
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PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> gcc b.c
PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> .\a.exe
enter the string
BMSCE
String s2 : BMSCE
 Size of string : 5
PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> []
```

OUTPUT 8

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.

```c
#include <stdio.h>
struct student{
  int rollno;
  char name[20];
  char sec[10];
  char dep[10];
  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("Department: ");
  scanf("%s",s1.dep);
  printf("Fees: ");
  scanf("%d",&s1.fees);
  printf("Result: ");
  scanf("%d",&s1.result);
  return s1;
}
```

```c
void print(struct student s1){
    printf("\nThe details of student who got highest marks are as follows\n");
    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);
}
```

```
Name: SAM
Section: CN
Department: CSE
Fees: 200000
Result: 85
Enter details of 2nd Student
roll No. 16
Name: TOM
Section: CN
Department: CSE
Fees: 200000
Result: 9

The details of student who got highest marks are as follows
Roll No.: 14
Name: SAM
Section: CN
Department: CSE
Fees: 200000
Result = 85
PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> []
```

OUTPUT 9

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

```c
#include <stdio.h>
int main()
{ int num1, num2, sum,subtr,mult;
float div;
int *ptr1, *ptr2;
ptr1 = &num1;
ptr2 = &num2;
printf("Enter any two numbers: ");
scanf("%d%d", ptr1, ptr2);
sum = *ptr1 + *ptr2;
subtr=*ptr1 - *ptr2;
mult= (*ptr1)*(*ptr2);
div= (float)(*ptr1)/(*ptr2);
printf("Sum = %d\nDifference = %d\nMultiplication = %d\nDivision = %.2f", sum,subtr,mult,div);
return 0;
}
```

```
Windows PowerShell
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PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> GCC B.C
PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> .\a.exe
Enter any two numbers: 5 6
Sum = 11
Difference = -1
Multiplication = 30
Division = 0.83
PS C:\Users\utkar_c0hqe7g\OneDrive\Documents\C (tutorials course)> []
```

OUTPUT 10