*PRACTICAL 1*

*Aim: Study syntax and programming concepts of C programming language.*

*This practical aims at acquainting students with the basic language, syntactical constructs of C language. Problem solving exercises using data types, operators, decision making statements and looping statements. After performing the practical exercises, students will be able to:*

*- Understand and memorize syntax of basic C program*

*- Use and manipulate variables*

*- Using decision making statements and looping statements for computation.*

*Requirements:1) A desktop computer system*

*2) Codeblocks IDE*

*Perform the following programs.*

# PRACTICAL-1

**Aim- WAP to print the message" Hello programmers welcome to the world of c".**

## Input:-

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

int main()
{
            printf("Hello welcome to the world of c"
\n");
   return 0;
}
```

## Output:-

**"Hello welcome to the world of c"**

# PRACTICAL- 2

## Aim- WAP to print the following.

### Input :-

```
#include <stdio.h>
 Void main ()
{
//hi I am aditya
Printf (“———————————————— \n”);
Printf (“*****************************************\n”);
Printf (“hi , my name is aditya \n”);
Pritnf (“*****************************************\n”);
printf(“I am studying in 1st year \n”);
Pritnf (“*****************************************\n”);
Printf(“————————————————\n”);
return 0;
}
```

### Output :-

```
————————————————-
**************************
Hi, my name is aditya
**************************
I am studying in 1st year
**************************
————————————————-
```

# PRACTICAL- 3

## Aim- WAP enter the simple value.

## Input:-

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

int main()
{
   int number;
   printf("Enter the number\n");
   scanf("%d", &number);
    printf("Number is %d\n", number);
   return 0;
}
```

## Output:-

```
Enter the number
87
Number is 87
```

# PRACTICAL- 4

## Aim- WAP to print sum of 2 numbers.

## Input:-

```
#include <stdio.h>

  Int main ()

{

Int a=10 , b=20,sum;

sum=a+b;

Printf (“sum of the entered numbers :   %d”,sum);

return 0;

}
```

## Output:-

sum=30

# PRACTICAL-5

## Input:-

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

int main()
{
   int num1, num2, sum, sub, mult;
   float div;
   printf("Enter the 2 values separated by comma: \n");
   scanf("%d%d", &num1, &num2);

   sum= num1+num2;
   sub=num1-num2;
   mult= num1*num2;
   div= (float)num1/num2;
   printf("The sum of 2 numbers is: %d \n", sum);
   printf("The subtraction of 2 numbers is: %d \n", sub);
   printf("The multi[plication of 2 numbers is: %d \n", mult);
   printf("The division of 2 numbers is : %f \n", div);
   return 0;
}
```

## Output:-

```
Enter the 2 values separated by comma:
89
98
The sum of 2 numbers is: 187
The subtraction of 2 numbers is: -9
The multi[plication of 2 numbers is: 8722
The division of 2 numbers is : 0.908163
```

# PRACTICAL-6

**Aim-** WAP to print average of 5 numbers.

## Input:-

```
#include <stdio.h>

int main()

{int a, b, c, e ,f ,g , h;

   printf("enter the two number:");

scanf("%d %d %d %d %d",&a,&b,&c,&e,&f);

g=a+b+c+e+f;

printf("%d+%d+%d+%d+%d=%d", a, b , c,e ,f,g);

h=g/5;

printf("%d/5=%d", g, h);

   return 0;
```

## Output:-

```
32765+877067680+0+4195440+0=88129588588129588 5/5=176259177
```

# PRACTICAL-7

**Aim-** WAP of static arithmetic operation of 2 values.

## Input:-

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

int main()
{
    int a=60;
    int b=80;
    int c;
    int d;
    int e;
    float f;
    c= a+b;
    d= a-b;
    e= a*b;
    f= (float)a/b;
    printf("The answer of addition is %d \n", c);
    printf("The answer of subtraction is %d \n", d);
    printf("The answer of multiplication is %d \n", e);
    printf("The answer of division is %f \n", f);
    return 0;
 }
```

## Output:-

```
The answer of addition is 140
The answer of subtraction is -20
The answer of multiplication is 4800
The answer of division is 0.750000
```

# PRACTICAL-8

**Aim-** Wap to swap tow values entered by user without using third variable

## Input:-

```
 #include <stdio.h>

int main()

{

    double first, second, temp;

     printf("Enter first number: ");

     scanf("%lf", &first);

     printf("Enter second number: ");

     scanf("%lf", &second);

     temp = first;

      first = second;

      second = temp;

     printf("\nAfter swapping, firstNumber = %.2lf\n", first);

     printf("After swapping, secondNumber = %.2lf", second);

     return 0;

}
```

## Output:-

```
Enter first number: 12
Enter second number: 23

After swapping, firstNumber = 23.00

After swapping, secondNumber = 12.00
```

# PRACTICAL-9

**Aim-** WAP to swap the two values enter by user by using the third variable.

## Input:-

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

int main()
{
    int num1, num2, temp;    // num1= 40 num2= 30
    printf(" Enter the 2 values separated by comma: \n");
    scanf("%d %d", &num1, &num2);
    temp= num1;
   num1 = num2;
   num2 = temp;
    printf("After swapping the numbers are %d and %d \n ", num1, num2);
    return 0;
}
```

## Output:-

Enter the 2 values:

40,  30

After swapping the numbers are 40 and 40

# PRACTICAL- 10

**Aim-** WAP to find the area and circumference of the circle, radius given by user.

## Input:-

```
#include <stdio.h>
int main() {
  Int r;
  float  area, ci,pi=3.14;
  printf("\n enter the value of r: ");
  scanf("%f", &r);
  area=PI*r*r;
  printf("\n answer: %f \n", area);
  ci=2*PI*r;
  printf(“\n circumference : %f”,ci);
  return 0;
}
```

## Output:-

```
enter the value of r:2
Area =12.56
Ci =12.56
```

# PRACTICAL- 11

**Aim-** WAP to find the area and circumference of the circle, radius given by user. Use symbolic constant for the value of PI.

## Input:-

```
#include <stdio.h>
#define PI 3.14
int main() {
  Int r;
  float  area, ci;
  printf("\n enter the value of r: ");
  scanf("%f", &r);
  area=PI*r*r;
  printf("\n answer: %f \n", area);
  ci=2*PI*r;
  printf(“\n circumference : %f”,ci);
  return 0;
}
```

## Output:-

```
enter the value of r:2
Area =12.56
Ci =12.56
```

# PRACTICAL- 12

**Aim-** WAP to find the area of the square and rectangle.

## Input:-

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

int main()
{
    int length, breadth, Area;
    printf("Enter the length: \n");
    scanf("%d", &length);

    Area= length*length;
    printf("Area of the square is %d \n", Area);

     printf("\nEnter the breadth: \n");
     scanf("%d", &breadth);

    Area = length*breadth;
    printf(" Area of the Rectangle is %d \n", Area);
    return 0;
}
```

## Output:-

```
Enter the length:

2

Area of the square is 4

Enter the breadth:

 4

Area of the Rectangle is 8
```

# PRACTICAL- 13

**Aim-** WAP to find out the area of the triangle.

## Input:-

Input :-

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

## Output :-

Enter sides of a triangle

3 4 5

Area of the triangle = 6.00

# PRACTICAL-14

**Aim-** WAP to get a character from a user and print its ASCII value.

## Input:-

```
#include <stdio.h>
int main()
{
   char c;
   printf("Enter a character:");
   scanf("%c",&c);
   printf("ASCII value of %c=%d",c,c);
   return 0;
}
```

## Output:-

Enter a character:f

ASCII value of f=102

# PRACTICAL- 15

**Aim-** WAP to find remainder and quotient from division of two numbers entered by the user.

## Input:-

```
#include <stdio.h>
#include <stdlib.h>
int main()
    int A, B, quotient, remainder;
    printf("Enter the two number A and B \n");
    scanf("%d%d", &A, &B);
    quotient= A / B;
    remainder= A % B;
    printf("The qoutient is %d \n", quotient);
     printf("\nThe  remainder is %d", remainder);
    return 0;
}
```

## Output-:

Enter the two number A and B are:

45 and 3

The qoutient is 15

The  remainder is 0

# PRACTICAL-16

**Aim-** WAP to show that the year entered by the user is leap year or not.

## Input:-

```
#include <stdio.h>

int main()
{
  int year;
  printf("Enter a year you want to check :  ");
  scanf("%d",&year);
   if(year % 4 == 0)
    {   //nested if else statement
        if(year % 100 == 0)
        {
            if(year % 400 == 0)
            printf("%d is a leap year",year);
            else
            printf("%d is not a leap year",year);
        }
        else
            printf("%d is a leap year",year);
    }
    else
      printf("%d is not a leap year”,year);
  return 0;
}
```

## Output:-

```
Enter a year you want to check :  2089
2089 is not a leap year
```

# PRACTICAL-17

**Aim-** WAP to check whether number entered by user is positive, negative, or zero with the use of conditional operator.

## Input:-

```
include <stdio.h>
 int main()
{
   int num;
     printf("Enter the number : ");
   scanf("%d", &num);
     if (num > 0)
       printf("%d is positive.",num);
   else if (num < 0)
       printf("%d is negative.",num );
   else if (num == 0)
       printf("%d is zero.", num);

   return 0;
}
```

## Output:-

```
Enter the number : 12
is positive.
```

# PRACTICAL- 18

**Aim-** WAP to find simple interest by entering the principal, rate, and time by the user.

## Input:-

```
#include <stdio.h>
int main()
{
   float  principle , time , rate, SI ;
      printf("Enter the Principle Amount : ");
      scanf("%f",&principle);
      printf("\nEnter the Time : ");
      scanf("%f",&time);
      printf("\nEnter the Rate of Interest : ");
      scanf("%f",&rate);
        SI= (principle*rate*time)/100;
   printf("Resultant SI value is : %f",SI);
return 0;
}
```

## Output:-

```
Enter the Principle Amount : 78643
Enter the Time : 3
Enter the Rate of Interest : 15
Resultant SI value is : 35389.351562
```

# PRACTICAL-19

**Aim-** WAP to convert fahrenheit value entered by user into celsius.

## Input:-

```
#include <stdio.h>
 int main()
{
    float celsius, fahrenheit;
     printf("Please Enter the temperature in Fahrenheit: \n");
    scanf("%f", &fahrenheit);
     celsius = (fahrenheit - 32) * 5 / 9;
    printf("\n %.2f Fahrenheit = %.2f Celsius", fahrenheit, celsius);
     return 0;
}
```

## Output:-

```
Please Enter the temperature in Fahrenheit:
43
43.00 Fahrenheit = 6.11 Celsius
```

# PRACTICAL-20

**Aim-** WAP to accept marks of 3 subjects from the user, calculate the average. Use relational operators and decision making statement.

## Input:-

```
#include <stdio.h>
int main() {
    float marks1 , marks2, marks3, average;
    printf("Enter marks obtained in subject 1 : ");
    scanf("%f" ,&marks1);
    printf("Enter marks obtained in subject 2: ");
    scanf("%f",&marks2);
    printf("Enter marks obtained in subject 3: ");
    scanf("%f",&marks3);
     average = (marks1 + marks2 + marks3) / 3;
    printf("Average : %0.3f\n", average);
   if (average >= 87 &&  average<=100){
      printf("pass with honours grade");
   }
   if(average >=70 && average<=86){
      printf("pass with distinction");
   }
   if(average >=60 && average<=69){
      printf("pass with average grade");
   }
   if (average >=36 && average<=48){
      printf("pass with third grade");
   }
   if (average <=35){
      printf("fail");
   }
    return 0;
}
```

## Output:-

```
Enter marks obtained in subject 1 : 98
Enter marks obtained in subject 2: 87
Enter marks obtained in subject 3: 56
Average : 80.333
pass with distinction
```

# PRACTICAL-21

**Aim-** WAP to find the smallest number between 3 numbers using conditional statement.

## Input:-

```
#include<stdio.h>
int main()
{
    int num1,num2,num3;
    printf("Enter three numbers:");
    scanf("%d %d %d",&num1,&num2,&num3);
    if(num1 < num2 && num1 < num3)
    {
        printf("%d is smallest",num1);
    }
    else if(num2 < num3)
    {
        printf("%d is smallest",num2);
    }
    else
    {
        printf("%d is smallest",num3);
    }
    return 0;
}
```

## Output:-

```
Enter three numbers: 2 3 5
2 3 5
2 is smallest
```

# PRACTICAL- 22

**Aim-** WAP to find the biggest number between 2 numbers using conditional statement.

## Input:-

```
#include <stdio.h>
int main()
{
    int n1 , n2 , max;
    printf("enter the values: ");
    scanf("%d %d",&n1 ,&n2);
        max = (n1 > n2) ? n1 : n2;
        printf("Largest number between %d and %d is %d. ",  n1, n2,max);
    return 0;
}
```

## Output:-

```
enter the values: 23 54
Largest number between 23 and 54 is 54.
```

## PRACTICAL- 23

**Aim-** WAP to adding a character with an integer.

**Input:-**

```
#include <stdio.h>

int main()
{
    char c;
    int a, sum;
    printf("Enter the character: \n");
    scanf("%c", &c);
     printf("The value of the character is %d \n\n", c);
     printf("Enter the integer: \n");
     scanf("%d", &a);
     sum= c+a;
     printf("The sum of character and integer is %d", sum);
    return 0;
}
```

**Output-:**

```
Enter the character:
w
The value of the character is 119
Enter the integer:
5
The sum of character and integer is 124
```

# PRACTICAL- 24

**Aim-** WAP to display the equation of line in the form of ax+ by=c, for a=6, b=9. C=18.

## Input:-

```
#include <stdio.h>
int main() {
    int  a, b, c;
    printf("Please enter  value of a :  ");
    scanf("%d",&a);
    printf("Please enter  value of b :  ");
    scanf("%d",&b);
    printf("Please enter  value of c :  ");
    scanf("%d",&c);
    printf("the equation of a line in the form ax +by = c for a, b, c is\n %dx + %dy = %d
",a,b,c);
    return 0;
}
```

## Output :-

```
Please enter  value of a :  6
Please enter  value of b :  9
Please enter  value of c :  18
the equation of a line in the form ax +by = c for a, b, c is
 6x + 9y = 18
```

# PRACTICAL- 25

**Aim-** WAP in c to calculate and print the electricity bill of a given user.

## Input:-

```
#include <stdio.h>
#include <string.h>
void main()
{
   int userid, unit;
   float chg, surchg=0, totalamt,netamt;
   char usernm[25];
   printf("Input User ID :");
   scanf("%d",&userid);
   printf("Input the name of the customer :");
   scanf("%s",usernm);
   printf("Input the unit consumed by the customer : ");
   scanf("%d",&unit);
   if (unit <=200 ){
chg = 1.50;}
   else if (unit>=201 && unit<=400){
chg = 1.75;}
else if (unit>=401 && unit<=600){
chg = 2.00;}
else{
chg = 2.50;}
   totalamt = unit*chg;
   if (totalamt>500)
surchg = totalamt*15/100.0;
   netamt = totalamt+surchg;
   if (netamt  < 150)
netamt =150;
   printf("\nElectricity Bill\n");
   printf("User ID No                              :%d\n",userid);
   printf("User  Name                              :%s\n",usernm);
   printf("unit Consumed                           :%d\n",unit);
   printf("Amount Charges                          :%f\n",chg,totalamt);
   printf("Surchage Amount                         :%f\n",surchg);
   printf("Net Amount Paid By the Customer   :%f\n",netamt);
Retun 0;

}
```

## Output:-

```
Input User ID :85876
Input the name of the customer :aditya
Input the unit consumed by the customer : 509
Electricity Bill
User ID No                                :85876
User  Name                                :aditya
```

| | |
|---|---|
| unit Consumed | :509 |
| Amount Charges | :2.000000 |
| Surchage Amount | :152.699997 |
| Net Amount Paid By the Customer | :1170.699951 |

# PRACTICAL- 26

**Aim-** WAP to find the square and cube of a given number.

## Input:-

```
#include<stdio.h>

int main()
{
int a,s,c;
printf("\n Enter A Number: ");
scanf("%d",&a);
s=a*a;  //Square = number * number
c=s*a;  //Cube = Square * number
printf("\n Square of %d is = %d",a,s);
printf("\n\n Cube of %d is = %d",a,c);
  return 0;
}
```

## Output:-

```
Enter A Number: 5
Square of 5 is = 25
Cube of 5 is = 125
```

# PRACTICAL- 27

**Aim-** WAP to read the floating number from the keyboard and print the fractional part and integer part separately.

## Input:-

```
#include <stdio.h>

int main()
{
    float f, t;
    int i;
    printf("Enter a floating number: ");
    scanf("%f", &f);
    i = f;
    printf("Integer part    :%d\n", i);
    t = f-i;
    printf("Fractional part :%f", t);
    return 0;
}
```

## Output :-

```
Enter a floating number: 12.5
Integer part    :12
Fractional part :0.500000
```

## PRACTICAL-28

**Aim-** WAP to check whether the character is alphabet, digit or special character.

## Input:-

```
#include <stdio.h>

int main()
{
    char ch;
    printf("Enter any character: ");
    scanf("%c", &ch);
    if(ch >= 'a' && ch <= 'z' ll ch >= 'A' && ch <= 'Z')
    {
        printf("'%c' is alphabet.", ch);
    }
    else if(ch >= '0' && ch <= '9')
    {
        printf("'%c' is digit.", ch);
    }
    else
    {
        printf("'%c' is special character.", ch);
    }
    return 0;
}
```

## Output :-

```
Enter any character: .
'.' is special character.
```

## PRACTICAL-29

**Aim-** WAP to print the given 3 integer in ascending order using conditional statement(if- else).

## Input:-

```
#include <stdio.h>
int a,b,c;
int main (){
        printf("Please enter 3 integers\n");
        scanf("%d %d %d",  &a,&b,&c);
        printf("The integers from smallest to largest are:\n");
        if (a<b) {
                if (b<c){
                printf("%d %d %d", a,b,c);
                }
                else if (a<c){
                printf("%d %d %d", a,c,b);
                }
                else {
                printf("%d %d %d", c,a,b);
                }
        }
        else{
                if (b>c){
                printf("%d %d %d", c,b,a);
                }
                else if (b<c){
                printf("%d %d %d", b,c,a);
                }
                else {
                printf("%d %d %d", b,a,c);
                }
            }
   return 0;
}
```

## Output :-

```
Please enter 3 integers
89
68
54
The integers from smallest to largest are:
54 68 89
```

# PRACTICAL-30

**Aim-** WAP to show the working of a basic calculator by taking choice of operation from a user. Use dynamic initialization of variables.

## Input:-

```
#include <stdio.h>
int main() {
    char operator;
    double first, second;
    printf("Enter an operator (+, -, *,/): ");
    scanf("%c", &operator);
    printf("Enter two operands: ");
    scanf("%lf %lf", &first, &second);
    switch (operator) {
    case '+':
        printf("%.1lf + %.1lf = %.1lf", first, second, first + second);
        break;
    case '-':
        printf("%.1lf - %.1lf = %.1lf", first, second, first - second);
        break;
    case '*':
        printf("%.1lf * %.1lf = %.1lf", first, second, first * second);
        break;
    case '/':
        printf("%.1lf / %.1lf = %.1lf", first, second, first / second);
        break;
        default:
        printf("Error! operator is not correct");
    }
    return 0;
}
```

## Output :-

```
Enter an operator (+, -, *,/): /
Enter two operands: 6
2
6.0 / 2.0 = 3.0
```

## PRACTICAL-30 secd.

**Aim-** WAP to show the working of a basic calculator by taking choice of operation from a user. Use dynamic initialization of variables.

## Input:-

```
#include <stdio.h>

int main()
{
   float a, b, choice;
   printf("Enter the choice: \n");
   printf("\n 1. Addition\n 2. Subtraction\n 3. Multiplication\n 4. Division\n");
   scanf("%f", &choice);

   printf("Enter the 2 numbers: \n");
   scanf("%f%f", &a, &b);

   if(choice==1)
   {
      printf("Addition of %f and%f is %f", a, b, (a+b));
   }
   else if(choice== 2)
   {
      printf("Subtraction of %f and%d is %f",a, b, (a-b));
   }
   else if (choice== 3)
   {
      printf("Multiplication of %f and %f is %f", a, b, (a*b));
   }
   else if(choice== 4)
   {
      if ( b!= 0)
      {
         printf("Division of %f and %f is %f", a, b, (a/b));
      }
      else
      {
         printf("Division is not possible \n");
      }
   }


   return 0;
}
```

## Output :-

```
Enter the choice:
4
1. Addition
2. Subtraction
3. Multiplication
4. Division
```

Enter the 2 numbers:
43, 89
Division of 43.0000and 89.0000 is 0.483146

# PRACTICAL-31

**Aim-** WAP to print the day of the week using switch case.

## Input:-

```
#include <stdio.h>

int main()
{
    int week;
    printf("Enter the number in range 1 to 7 \n");
    scanf("%d", &week);
    switch(week)
    {
        case 1:
        printf("Monday \n");
        break;
         case 2:
         printf("Tuesday \n");
         break;
          case 3:
          printf("Wednesday \n");
          break;
           case 4:
           printf("Thursday \n");
           break;
            case 5:
            printf("Friday \n");
            break;
             case 6:
            printf("Saturday \n");
             break;
              case 7:
            printf("Sunday \n");
             break;
         default:("SORRY no result”);
        Break;
    }
    return 0;
}
```

## Output:-

```
Enter the number in range 1 to 7:
2
Tuesday
```

# PRACTICAL-32

**Aim-** WAP to calculate roots of a quadratic equation using formula for calculating the roots. Here d is discriminant.

## Input:-

```
#include <stdio.h>

int main()
{
   float a, b, c, Discriminant, root1, root2, Real, Imaginary;
   printf("Enter the values of a, b and c: \n");
   scanf("%f%f%f", &a, &b, &c);
   Discriminant= b*b- 4*a*c;
   printf("The value of determinant is %f \n", Discriminant);
   if(Discriminant>0)
   {
   root1= -b+ sqrt(Discriminant) / 2*a;
   root2= -b- sqrt(Discriminant) / 2*a;
   printf("The roots are %f and %f \n", root1, root2);
   }
   else if(Discriminant<0)
   {
      Real= -b/2*a;
      Imaginary= sqrt(-Discriminant) / 2*a;
      printf("The roots are %f+ i %f and %f -i %f \n", Real, Imaginary, Real);
   }
   else if("Discriminant==0")
   {
      root1= -b/2*a;
      root2= -b/2*a;
      printf("The roots are %f \n", root1);

   }
   return 0;
}
```

## Output:-

```
Enter the values of a, b, c:
3, 6, 7
The value of determinant is -48.000000
The roots are -9.000000+ i 10.392304 and  -9.000000+ i
8192.001980
```

## PRACTICAL-33

**Aim-**Find the net salary of an employee.

Net Salary = Basic Salary + DA + HRA+MA-PF-IT Where
DA = 70% of basic salary,
HRA = 15% of basic salary
PF = 8% of basic salary
IT = 12% of basic salary
MA = Rs. 1000 fixed. Use symbolic constant.

## Input:-

```
#include <stdio.h>
#define ma 1000

int main()
{
	//variable to store values
	float basic, da, hra,pf,it,net_salary;
	//input required fields
	printf("Enter Basic Salary (Rs.): ");
	scanf("%f",&basic);
	printf("Enter HRA (Rs.): ");
	scanf("%f",&hra);
	//calculate DA 70% of Basic Salary
	da = (basic*70)/100;
	//calculate PF 8% of Basic salary
	pf = (basic*8)/100;
	//calculate IT, 12% of Basic salary
	it = (basic*12)/100;
	//calculate hra ,15% of basic salary
	hra=(basic*15)/100;
	//calculate net salary
	net_salary = basic + da + hra + ma - pf-it;
	//printing Net salary
	printf("Net Salary is: Rs. %.02f\n",net_salary);
	return 0;
}
```

## Output:-

```
Enter Basic Salary (Rs.): 150000
Enter HRA (Rs.): 150
Net Salary is: Rs. 248500.00
```

**PRACTICAL-34**

**Aim- WAP to display integer, float and double values from user using qualifiers short, long, signed and unsigned.**

**Input:-**

```
#include<stdio.h>
#include<limits.h>
#include<float.h>
int main(void)
{
   printf("%30s %12s %28s\n", "", "Size", "Range");
   printf("%-30s %10lu %25d - %d\n", "char or signed char", sizeof(char), CHAR_MIN,
CHAR_MAX);
   printf("%-30s %10lu %25d - %d\n", "unsigned char", sizeof(unsigned char), 0,
UCHAR_MAX);
   printf("%-30s %10lu %25d - %d\n", "int or signed int", sizeof(int), INT_MIN, INT_MAX);
   printf("%-30s %10lu %25d - %ud\n", "unsigned int", sizeof(unsigned int), 0, UINT_MAX);
   printf("%-30s %10lu %25hd - %hd\n", "short int or short signed int", sizeof(short int),
SHRT_MIN, SHRT_MAX);
   printf("%-30s %10lu %25d - %d\n", "unsigned short int", sizeof(unsigned short int), 0,
USHRT_MAX);
   printf("%-30s %10lu %25ld - %ld\n", "long int or signed long int", sizeof(long int),
LONG_MIN, LONG_MAX);
   printf("%-30s %10lu %25d - %lu\n", "unsigned long int", sizeof(unsigned long int), 0,
ULONG_MAX);
   printf("%-30s %10lu %25le - %le\n", "float", sizeof(float), FLT_MIN, FLT_MAX);
   printf("%-30s %10lu %25le - %le\n", "double", sizeof(double), DBL_MIN, DBL_MAX);
   printf("%-30s %10lu %25Le - %Le\n", "long double", sizeof(long double), LDBL_MIN,
LDBL_MAX);
   return 0; // return 0 to operating system
}
```

**Output:-**

```
                                Size                 Range
char or signed char               1                -128 - 127
unsigned char                     1                   0 - 255
int or signed int                 4          -2147483648 - 2147483647
unsigned int                      4                   0 - 4294967295d
short int or short signed int     2                -32768 - 32767
unsigned short int                2                   0 - 65535
long int or signed long int       8   -9223372036854775808 - 9223372036854775807
unsigned long int                 8                   0 - 18446744073709551615
float                             4         1.175494e-38 - 3.402823e+38
double                            8          2.225074e-308 - 1.797693e+308
long double                      16          3.362103e-4932 - 1.189731e+4932
```

**PRACTICAL-35(while loop)**

**Aim:-WAP to print numbers from 1 to n. The value of n is given by the user using while, do … while and for loop.**

**Input:-**

```
#include <stdio.h>
int main()
{
        int number;
        int n;
        number =1;
        printf("Enter the value of N: ");
        scanf("%d",&n);
        printf("Numbers from 1 to %d: \n",n);
        while(number <= n)
        {
                printf("%d \n",number);
                number++;
        }
        return 0;
}
```

**Output:-**

```
Enter the value of N: 5
Numbers from 1 to 5:
1
2
3
4
5
```

**PRACTICAL-35 (for loop)**

**Aim:-WAP to print numbers from 1 to n. The value of n is given by the user using while, do … while and for loop.**

**Input:-**

```
#include <stdio.h>

int main()
{
        int number;
        int n;
        printf("Enter the value of N: ");
        scanf("%d",&n);
        printf("Numbers from 1 to %d: \n",n);
        for(int number=1;number <= n;number++)
        {
                printf("%d \n",number);
        }
        return 0;
}
```

**Output:-**

```
Enter the value of N: 5
Numbers from 1 to 5:
1
2
3
4
5
```

**PRACTICAL-35 (do…while loop)**
**Aim:-WAP to print numbers from 1 to n. The value of n is given by the user using while, do … while and for loop.**
**Input:-**

```
#include <stdio.h>

int main()
{
        int number;
        int n;
        number=1;
        printf("Enter the value of N: ");
        scanf("%d",&n);
        printf("Numbers from 1 to %d: \n",n);
        do
        {
                printf("%d \n",number);
                number++;
        }while(number<=n);
        return 0;
}
```

**Output:-**

```
Enter the value of N: 5
Numbers from 1 to 5:
1
2
3
4
5
```

**PRACTICAL-36(for loop)**

**Aim:WAP to print multiplication table of a number entered by user using for loop and while loop.**

**input:-**

```
int main()
{
   int n, i;
    printf("Enter a Number ");
    scanf("%d",&n);
    for(i=1; i<=10; ++i)
    {
        printf("%d * %d = %d \n", n, i, n*i);
    }
    return 0;
}
```

**Output:-**

```
Enter a Number 4
4 * 1 = 4
4 * 2 = 8
4 * 3 = 12
4 * 4 = 16
4 * 5 = 20
4 * 6 = 24
4 * 7 = 28
4 * 8 = 32
4 * 9 = 36
4 * 10 = 40
```

**PRACTICAL-36(while loop)**

**Aim:WAP to print multiplication table of a number entered by user using for loop and while loop.**

**input:-**

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

int main()
{
   int n, i;
    printf("Enter a Number ");
    scanf("%d",&n);
    i=1;
    while(i<=10)
    {
        printf("%d * %d = %d \n", n, i, n*i);
        i++;
    }
    return 0;
}
```

**Output:-**

```
Enter a Number 2
2 * 1 = 2
2 * 2 = 4
2 * 3 = 6
2 * 4 = 8
2 * 5 = 10
2 * 6 = 12
2 * 7 = 14
2 * 8 = 16
2 * 9 = 18
2 * 10 = 20
```

**PRACTICAL-36(do….while loop)**

**Aim:WAP to print multiplication table of a number entered by user using for loop and while loop.**

**input:-**

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

int main()
{
   int n, i;
    printf("Enter a Number ");
    scanf("%d",&n);
    i=1;
    do
    {
        printf("%d * %d = %d \n", n, i, n*i);
        i++;
    }while(i<=10);
    return 0;
}
```

**Output:-**

```
Enter a Number 3
3 * 1 = 3
3 * 2 = 6
3 * 3 = 9
3 * 4 = 12
3 * 5 = 15
3 * 6 = 18
3 * 7 = 21
3 * 8 = 24
3 * 9 = 27
3 * 10 = 30
```

**PRACTICAL-37(while loop)**

**Aim:-WAP to print all even numbers between 1 to 100 using while loop and for loop.**

**input:-**

```
#include <stdio.h>

int main()
{
        int number;
        int n;
        number=2;
        printf("Enter the value of N: ");
        scanf("%d",&n);
        printf("Numbers from 1 to %d: \n",n);
        while(number<=n)
        {
                printf("%d \n",number);
                number+=2;
        }
        return 0;
}
```

**Output:-**

```
Enter the value of N: 100
Numbers from 1 to 100:
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
50
52
54
```

56
58
60
62
64
66
68
70
72
74
76
78
80
82
84
86
88
90
92
94
96
98
100

**PRACTICAL-37(do…..while loop)**

**Aim:-WAP to print all even numbers between 1 to 100 using while loop and for loop.**

**input:-**

```
#include <stdio.h>

int main()
{
        int number;
        int n;
        number=2;
        printf("Enter the value of N: ");
        scanf("%d",&n);
        printf("Numbers from 1 to %d: \n",n);
        do
        {

                printf("%d \n",number);
                number+=2;
        }while(number<=n);
        return 0;
}
```

**Output:-**

```
Enter the value of N: 100
Numbers from 1 to 100:
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
50
52
```

54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
84
86
88
90
92
94
96
98
100

**PRACTICAL-37(for  loop)**

**Aim:-WAP to print all even numbers between 1 to 100 using while loop and for loop.**

**input:-**

```
#include <stdio.h>

int main()
{
        int number;
        int n;
        number=2;
        printf("Enter the value of N: ");
        scanf("%d",&n);
        printf("Numbers from 1 to %d: \n",n);
        for(number=2;number<=n;number+=2)
        {
                printf("%d \n",number);
        }
        return 0;
}
```

**Output:-**

```
Enter the value of N: 100
Numbers from 1 to 100:
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
50
52
54
56
```

58
60
62
64
66
68
70
72
74
76
78
80
82
84
86
88
90
92
94
96
98
100

## PRACTICAL-38(while loop)

**aim:-WAP to print all odd numbers between 1 to 100 using do … while loop and for loop.**

**input:-**

```
#include <stdio.h>

int main()
{
        int number;
        int n;
        number=1;
        printf("Enter the value of N: ");
        scanf("%d",&n);
        printf("Numbers from 1 to %d: \n",n);
        while(number<=n)
        {
                printf("%d \n",number);
      number+=2;
        }
        return 0;
}
```

**Output:-**

```
Enter the value of N: 100
Numbers from 1 to 100:
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
31
33
35
37
39
41
43
45
47
49
51
53
55
```

57
59
61
63
65
67
69
71
73
75
77
79
81
83
85
87
89
91
93
95
97
99

## PRACTICAL-38(do…..while loop)

**aim:-WAP to print all odd numbers between 1 to 100 using do … while loop and for loop.**

**input:-**

```
#include <stdio.h>

int main()
{
        int number;
        int n;
        number=1;
        printf("Enter the value of N: ");
        scanf("%d",&n);
        printf("Numbers from 1 to %d: \n",n);
        do
        {
                printf("%d \n",number);
      number+=2;
        }while(number<=n);
        return 0;
}
```

**Output:-**

```
Enter the value of N: 100
Numbers from 1 to 100:
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
31
33
35
37
39
41
43
45
47
49
51
53
55
```

57
59
61
63
65
67
69
71
73
75
77
79
81
83
85
87
89
91
93
95
97
99

**PRACTICAL-38(for loop)**

**aim:-WAP to print all odd numbers between 1 to 100 using do … while loop and for loop.**

**input:-**

```
#include <stdio.h>

int main()
{
        int number;
        int n;
        printf("Enter the value of N: ");
        scanf("%d",&n);
        printf("Numbers from 1 to %d: \n",n);
        for(number=1;number<=n;number+=2)
        {
                printf("%d \n",number);
        }
        return 0;
}
```

**Output:-**

```
Enter the value of N: 100
Numbers from 1 to 100:
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
31
33
35
37
39
41
43
45
47
49
51
53
55
57
59
```

61
63
65
67
69
71
73
75
77
79
81
83
85
87
89
91
93
95
97
99

**PRACTICAL-39(while loop)**

**aim:-WAP to print sum of n numbers starting from 1 to n using loop. The value of n must be entered by user.**

**input:-**

```
#include <stdio.h>

int main()
{
        int number,n,sum=0;
    number=1;
        printf("Enter the value of N: ");
        scanf("%d",&n);
        printf("Numbers from 1 to %d: \n",n);
        while(number<=n)
        {
       sum+=number;
       number++;
        }
    printf("sum=%d",sum);
        return 0;
}
```

**Output:-**

```
numbers from 1 to 100:
sum=5050
```

**PRACTICAL-39(do……while loop)**

**aim:-WAP to print sum of n numbers starting from 1 to n using loop. The value of n must be entered by user.**

**input:-**

```
#include <stdio.h>

int main()
{
        int number,n,sum=0;
    number=1;
        printf("Enter the value of N: ");
        scanf("%d",&n);
        printf("Numbers from 1 to %d: \n",n);
        do
        {
       sum+=number;
       number++;
         }while(number<=n);
    printf("sum=%d",sum);
        return 0;
}
```

**Output:-**

```
numbers from 1 to 100:
sum=5050
```

**PRACTICAL-39(for  loop)**

**aim:-WAP to print sum of n numbers starting from 1 to n using loop. The value of n must be entered by user.**

**input:-**

```
#include <stdio.h>

int main()
{
        int number,n,sum=0;
    number=1;
        printf("Enter the value of N: ");
        scanf("%d",&n);
        printf("Numbers from 1 to %d: \n",n);
        for(number=1;number<=n;number++)
        {
       sum+=number;
        }
    printf("sum=%d",sum);
        return 0;
}
```

**Output:-**

```
numbers from 1 to 100:
sum=5050
```

**PRACTICAL-40(while loop)**

**aim:-WAP to count the number of digits in a number.**

For instance, if the user enters 455, the answer should be 3.

**input:-**

```
#include <stdio.h>
int main() {
    long n;
    int count = 0;
    printf("Enter an integer: ");
    scanf("%ld", &n);
    while (n != 0) {
        n /= 10;
        ++count;
    }
    printf("Number of digits: %d", count);
    return 0;
}
```

**Output:-**

```
Enter an integer: 455
Number of digits: 3
```

**PRACTICAL-40(do……while loop)**

**aim:-WAP to count the number of digits in a number.**

For instance, if the user enters 455, the answer should be 3.

**input:-**

```
#include <stdio.h>
int main() {
    long n;
    int count = 0;
    printf("Enter an integer: ");
    scanf("%ld", &n);
    do{
        n /= 10;
        ++count;
    }while(n !=0);
    printf("Number of digits: %d", count);
    return 0;
}
```

**Output:-**

```
Enter an integer: 455
Number of digits: 3
```

**PRACTICAL-40(for loop)**

**aim:-WAP to count the number of digits in a number.**

For instance, if the user enters 455, the answer should be 3.

**input:-**

```
#include <stdio.h>
int main() {
    long n;
    int count = 0;
    printf("Enter an integer: ");
    scanf("%ld", &n);
    for(count=0;n!=0;count++){
        n /= 10;
    }
    printf("Number of digits: %d", count);
    return 0;
}
```

**Output:-**

```
Enter an integer: 455
Number of digits: 3
```

**PRACTICAL-41(while loop)**

**aim:-WAP to print Factorial of number up till n using loop. Value of n will be given by user.**

**input:-**

```
#include <stdio.h>
int main() {
    int n, i;
    unsigned long long fact = 1;
    i=1;
    printf("Enter an integer: ");
    scanf("%d", &n);
        while (i <= n) {
            fact *= i;
            i++;
        }
        printf("Factorial of %d = %llu", n, fact);
    return 0;
}
```

**Output:-**

```
Enter an integer: 10
Factorial of 10 = 3628800
```

**PRACTICAL-41(do..while loop)**

**aim:-WAP to print Factorial of number up till n using loop. Value of n will be given by user.**

**input:-**

```
#include <stdio.h>
int main() {
    int n, i;
    unsigned long long fact = 1;
    i=1;
    printf("Enter an integer: ");
    scanf("%d", &n);
        do{
            fact *= i;
            i++;
        }while(i<=n);
        printf("Factorial of %d = %llu", n, fact);
    return 0;
}
```

**Output:-**

```
Enter an integer: 10
Factorial of 10 = 3628800
```

**PRACTICAL-41(for  loop)**

**aim:-WAP to print Factorial of number up till n using loop. Value of n will be given by user.**

**input:-**

```
#include <stdio.h>
int main() {
    int n, i;
    unsigned long long fact = 1;
    printf("Enter an integer: ");
    scanf("%d", &n);
        for (i = 1; i <= n; ++i) {
            fact *= i;
        }
        printf("Factorial of %d = %llu", n, fact);
    return 0;
}
```

**Output:-**

```
Enter an integer: 10
Factorial of 10 = 3628800
```

**PRACTICAL-42(while  loop)**

**aim:-WAP to print Fibonacci Series up to n terms. Value of n will be given by user. (e.g., if user enters 5, it should be printed as 0 1 1 2 3)**

**input:-**

```
#include <stdio.h>
int main() {
    int t1 = 0, t2 = 1, nextTerm = 0, n;
    printf("Enter a positive number: ");
    scanf("%d", &n);
    printf("Fibonacci Series: %d, %d, ", t1, t2);
    nextTerm = t1 + t2;
    while (nextTerm <= n) {
        printf("%d, ", nextTerm);
        t1 = t2;
        t2 = nextTerm;
        nextTerm = t1 + t2;
    }
    return 0;
}
```

**Output:-**

```
Enter a positive number: 50
Fibonacci Series: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34
```

**PRACTICAL-42(do….while  loop)**

**aim:-WAP to print Fibonacci Series up to n terms. Value of n will be given by user. (e.g., if user enters 5, it should be printed as 0 1 1 2 3)**

**input:-**

```
#include <stdio.h>
int main() {
    int t1 = 0, t2 = 1, nextTerm = 0, n;
    printf("Enter a positive number: ");
    scanf("%d", &n);
    printf("Fibonacci Series: %d, %d, ", t1, t2);
    nextTerm = t1 + t2;
    do{
        printf("%d, ", nextTerm);
        t1 = t2;
        t2 = nextTerm;
        nextTerm = t1 + t2;
    }while(nextTerm<=n);
    return 0;
}
```

**Output:-**

```
Enter a positive number: 50
Fibonacci Series: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34
```

**PRACTICAL-42(for  loop)**

**aim:-WAP to print Fibonacci Series up to n terms. Value of n will be given by user. (e.g., if user enters 5, it should be printed as 0 1 1 2 3)**

**input:-**

```
#include <stdio.h>
int main() {
    int t1 = 0, t2 = 1, nextTerm = 0, n;
    printf("Enter a positive number: ");
    scanf("%d", &n);
    printf("Fibonacci Series: %d, %d, ", t1, t2);
    nextTerm = t1 + t2;
    for(t2=1;nextTerm<=n;nextTerm=t1+t2) {
        printf("%d, ", nextTerm);
        t1 = t2;
        t2 = nextTerm;
        nextTerm = t1 + t2;
    }
    return 0;
}
```

**Output:-**

```
Enter a positive number: 50
Fibonacci Series: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34
```

**PRACTICAL-43(while  loop)**

**aim:-WAP to print reverse of a number entered by user. E.g. if user enters 123, it should print 321**

**input:-**

```
#include <stdio.h>
int main() {
    int n, rev = 0, remainder;
    printf("Enter an integer: ");
    scanf("%d", &n);
    while (n != 0) {
        remainder = n % 10;
        rev = rev * 10 + remainder;
        n /= 10;
    }
    printf("Reversed number = %d", rev);
    return 0;
}
```

**Output:-**

```
Enter an integer: 123
Reversed number = 321
```

**PRACTICAL-43(do…while  loop)**

**aim:-WAP to print reverse of a number entered by user. E.g. if user enters 123, it should print 321**

**input:-**

```
#include <stdio.h>
int main() {
    int n, rev = 0, remainder;
    printf("Enter an integer: ");
    scanf("%d", &n);
    do{
        remainder = n % 10;
        rev = rev * 10 + remainder;
        n /= 10;
    }while(n !=0);
    printf("Reversed number = %d", rev);
    return 0;
}
```

**Output:-**

```
Enter an integer: 123
Reversed number = 321
```

**PRACTICAL-43(for loop)**

**aim:-WAP to print reverse of a number entered by user. E.g. if user enters 123, it should print 321**

**input:-**

```
#include <stdio.h>
int main() {
    int n, rev = 0, remainder;
    printf("Enter an integer: ");
    scanf("%d", &n);
    for(rev=0;n != 0;n/=10){
        remainder = n % 10;
        rev = rev * 10 + remainder;
        n /= 10;
    }
    printf("Reversed number = %d", rev);
    return 0;
}
```

**Output:-**

```
Enter an integer: 123
Reversed number = 321
```

**PRACTICAL-44(while loop)**

**aim:-WAP to check whether number entered by user is a palindrome using loop.**

**input:-**

```
#include <stdio.h>
int main() {
    int n, reversedN = 0, remainder, originalN;
    printf("Enter an integer: ");
    scanf("%d", &n);
    originalN = n;
    while (n != 0) {
        remainder = n % 10;
        reversedN = reversedN * 10 + remainder;
        n /= 10;
    }
    if (originalN == reversedN)
        printf("%d is a palindrome.", originalN);
    else
        printf("%d is not a palindrome.", originalN);

    return 0;
}
```

**Output:-**

```
enter an integer: 1111
1111 is a palindrome.
```

**PRACTICAL-44(do…while loop)**

**aim:-WAP to check whether number entered by user is a palindrome using loop.**

**input:-**

```
#include <stdio.h>
int main() {
    int n, reversedN = 0, remainder, originalN;
    printf("Enter an integer: ");
    scanf("%d", &n);
    originalN = n;
    do{
        remainder = n % 10;
        reversedN = reversedN * 10 + remainder;
        n /= 10;
    }while(n != 0);
    if (originalN == reversedN)
        printf("%d is a palindrome.", originalN);
    else
        printf("%d is not a palindrome.", originalN);

    return 0;
}
```

**Output:-**

```
enter an integer: 1111
1111 is a palindrome.
```

**PRACTICAL-44(for loop)**

**aim:-WAP to check whether number entered by user is a palindrome using loop.**

**input:-**

```
#include <stdio.h>
int main() {
    int n, reversedN = 0, remainder, originalN;
    printf("Enter an integer: ");
    scanf("%d", &n);
    originalN = n;
   for(reversedN=0;n!=0;n/=10){
        remainder = n % 10;
        reversedN = reversedN * 10 + remainder;
        n /= 10;
    }
    if (originalN == reversedN)
        printf("%d is a palindrome.", originalN);
    else
        printf("%d is not a palindrome.", originalN);

    return 0;
}
```

**Output:-**

```
enter an integer: 1111
1111 is a palindrome.
```

**PRACTICAL-45**

**aim:-WAP to find summation of individual digits of a number using loop. (E.g. If user enters 503, answer should be 5+0+3 = 8).**

**input:-**

```
# include<stdio.h>
int main()
{
int sum = 0,n;
printf("enter the value :");
scanf("%d",&n);
while (n != 0)
{
        sum = sum + n % 10;
        n = n/10;
}
printf(" %d ", sum);
return 0;
}
```

**Output:-**

```
enter the value :503
 8
```

**PRACTICAL-46**

**aim:-WAP to check whether number entered by user is an Armstrong Number. (A positive number is said to be Armstrong number of the order n if** $abc\ldots.n = a^n + b^n + c^n + \ldots\ldots\ldots\ldots$**, E.g.** $153 = 1^3 + 5^3 + 3^3$**).**

**input:-**

```
#include<stdio.h>
int main()
{
    int num, originalNum, remainder, result = 0;
    printf("Enter a three-digit integer: ");
    scanf("%d", &num);
    originalNum = num;
    while (originalNum != 0) {
        remainder = originalNum % 10;
       result += remainder * remainder * remainder;
       originalNum /= 10;
    }
    if (result == num)
        printf("%d is an Armstrong number.", num);
    else
        printf("%d is not an Armstrong number.", num);
    return 0;
}
```

**Output:-**

```
Enter a three-digit integer: 153
153 is an Armstrong number.
```

**PRACTICAL-47**

**aim:-WAP to check whether number entered by user is Prime number using loop.**

**input:-**

```
#include <stdio.h>
int main() {
    int n, i, flag = 0;
    i=2;
    printf("Enter a positive integer: ");
    scanf("%d", &n);
    while ( i <= n / 2) {
        if (n % i == 0) {
            flag = 1;
            ++i;
            break;
        }
    }
    if (n == 1) {
        printf("1 is neither prime nor composite.");
    }
    else {
        if (flag == 0)
            printf("%d is a prime number.", n);
        else
            printf("%d is not a prime number.", n);
    }
    return 0;
}
```

**Output:-**

```
Enter a positive integer: 4
4 is not a prime number.
```

**PRACTICAL-48**

**aim:-WAP for program to read age of n persons and display only those persons whose age between 30 to 50.**

**input:-**

```
#include<stdio.h>
int main()
{
    int age,n;
    while (n!=0)
    {
        printf("Enter age of person [%d]: ",age);
                    scanf("%d",&age);
        if (age>=30 && age<=50 )
     {
       printf("see the persone age %d.\n",age);
     }
     else
     {
         printf("does'n see the person who age does'n between 30 to 50.\n");
     }
     break;
    }

    return 0;
}
```

**Output:-**

```
Enter age of person : 23
does'n see the person who age does'n between 30 to 50.
```

**PRACTICAL-49**

**aim:-WAP to Print the following pattern using loop:**

*
**
***
****
*****

**input:-**

```
#include <stdio.h>
int main() {
   int i, j, rows;
   printf("Enter the number of rows: ");
   scanf("%d", &rows);
   for (i = 1; i <= rows; ++i) {
      for (j = 1; j <= i; ++j) {
         printf("* ");
      }
      printf("\n");
   }
   return 0;
}
```

**Output:-**

```
Enter the number of rows: 5
*
* *
* * *
* * * *
* * * * *
```

**PRACTICAL-50**

**aim:-WAP to print the following pattern using loop:**

*****

****

***

**

*

**input:-**

```
#include <stdio.h>
int main() {
   int i, j, rows;
   printf("Enter the number of rows: ");
   scanf("%d", &rows);
   for (i =rows; i >=1; i--) {
      for (j = 1; j <=i; j++) {
         printf("* ");
      }
      printf("\n");
   }
   return 0;
}
```

**Output:-**

```
Enter the number of rows: 5
*****
****
***
**
*
```

**PRACTICAL-51**

**aim:-WAP to print the following pattern using loop.**

```
    *
   ***
  *****
 *******
```

**input:-**

```
#include <stdio.h>
int main() {
  int i, space, rows, k = 0;
  printf("Enter the number of rows: ");
  scanf("%d", &rows);
  for (i = 1; i <= rows; ++i, k = 0) {
    for (space = 1; space <= rows - i; ++space) {
      printf("  ");
    }
    while (k != 2 * i - 1) {
      printf("* ");
      ++k;
    }
    printf("\n");
  }
  return 0;
}
```

**Output:-**

```
Enter the number of rows: 5
      *
     * * *
    * * * * *
  * * * * * * *
* * * * * * * * *
```

**PRACTICAL-52**

**aim:-wAP to print a full pyramid of symbol $ up to height 5 using loop.**

**input:-**

```
#include <stdio.h>
int main() {
  int i, space, rows, k = 0;
  printf("Enter the number of rows: ");
  scanf("%d", &rows);
  for (i = 1; i <= rows; ++i, k = 0) {
    for (space = 1; space <= rows - i; ++space) {
      printf("  ");
    }
    while (k != 2 * i - 1) {
      printf("$ ");
      ++k;
    }
    printf("\n");
  }
  return 0;
}
```

**Output:-**

```
nter the number of rows: 5
          $
        $ $ $
      $ $ $ $ $
    $ $ $ $ $ $ $
  $ $ $ $ $ $ $ $ $
```

**PRACTICAL-53**

**aim:-**Distance between two points $(x_1, y_1)$, $(x_2, y_2)$ is given by the formula $D^2 = (x_2 - x_1)^2 + (y_2 - y_1)^2$. Write a program to compute D.

**input:-**

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

int main(){
    float x1,x2,y1,y2, distance;
    printf("enter the value of (x1,y1):");
    scanf("%f%f",&x1,&y1);
    printf("enter the value of (x2,y2):");
    scanf("%f%f",&x2,&y2);
    distance = sqrt( (x2 - x1)*(x2 - x1) + (y2 - y1)*(y2 - y1) );
    printf("Distance between (%0.2f, %0.2f) and (%0.2f, %0.2f) is %0.2f\n", x1, y1, x2, y2,
distance);
  return 0;
}
```

**Output:-**

```
enter the value of (x1,y1):2 3
enter the value of (x2,y2):10 8
Distance between (2.00, 3.00) and (10.00, 8.00) is 9.43
```

**PRACTICAL-54**

**aim:-WAP to determine and print the sum of harmonic series for a given value of**

N: 1+ ½ + 1/3 + …… + 1/n. Where n is the value entered by user.

**input:-**

```
#include <stdio.h>
int main()
{
   int i,n;
   float s=0.0;
   printf("Input the number of terms : ");
   scanf("%d",&n);
   printf("\n\n");
   for(i=1;i<=n;i++)
   {
       if(i<n)
       {
     printf("1/%d + ",i);
     s+=1/(float)i;
       }
     if(i==n)
     {
     printf("1/%d ",i);
     s+=1/(float)i;
     }
     }
        printf("\nSum of Series upto %d terms : %f \n",n,s);
}
```

**Output:-**

```
1/1 + 1/2 + 1/3 + 1/4 + 1/5
Sum of Series upto 5 terms : 2.283334
```

**PRACTICAL-55**

**aim:-**WAP to print ASCII values of characters from A to Z and a to z using loop.

**input:-**

```
#include<stdio.h>

int main()
{
    char c;
   c= 'A';
    while (c<='Z')
    {
        printf("%c   ",c);
        c++;
    }
    return 0;
}
```

**Output:-**

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

**PRACTICAL-56**

**aim:-**WAP to convert upper case character entered by user into lowercase and vice versa.

**input:-**

```
#include <stdio.h>
int main() {
    char c;
    printf("Enter 1 uppercase alphabets.\n");
    printf("Enter 2 lowercase alphabets. \n");
    scanf("%c", &c);

    if (c == '1' ) {
        for (c = 'A'; c <= 'Z'; ++c)
            printf("%c ", c);
    } else if (c == '2' ) {
        for (c = 'a'; c <= 'z'; ++c)
            printf("%c ", c);
    } else {
        printf("Error! You entered an invalid character.");
    }

    return 0;
}
```

**Output:-**

```
Enter 1 uppercase alphabets.
Enter 2 lowercase alphabets.
1
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
```

**PRACTICAL-57**

**aim:-**WAP to print 1 to 10 using go to statement

**input:-**

```
#include<stdio.h>
int main()
{
    int a=1;
    number:
    printf("%d \n",a);
    a++;
    while (a<=10)
    {
        goto number;
    }
     return 0;
}
```

**Output:-**

```
1
2
3
4
5
6
7
8
9
10
```

**PRACTICAL-58**

**aim:-**A B B C C C
D D D D E E E E E

**input:-**

```
#include <stdio.h>
int main() {
   int i, j,row;
   char input, alphabet = 'A';
   printf("Enter a uppercase character : ");
   scanf("%c", &input);
   printf("enter the row:");
   scanf("%d",&row);
   for (i = 1; i <= (input - 'A' + row); ++i) {
      for (j = 1; j <= i; ++j) {
         printf("%c ", alphabet);
      }
      ++alphabet;
      printf("\n");
   }
   return 0;
}
```

**Output:-**

```
enter the row:5
A
B B
C C C
D D D D
E E E E E
```

**PRACTICAL-59**

**aim:-**1 2 3 4 5 6 7 8 9 10

**input:-**

```
#include <stdio.h>
int main() {
   int rows, i, j, number = 1;
   printf("Enter the number of rows: ");
   scanf("%d", &rows);
   for (i = 1; i <= rows; i++) {
      for (j = 1; j <= i; ++j) {
         printf("%d ", number);
         ++number;
      }
      printf("\n");
   }
   return 0;
}
```

**Output:-**

```
Enter the number of rows: 4
1
2 3
4 5 6
7 8 9 10
```

**PRACTICAL-60**

**aim:-**WAP to Display Armstrong Number Between 100 to 5000 Intervals.

**input:-**

```
#include <math.h>
#include <stdio.h>
int main() {
  int low, high, number, originalNumber, rem, count = 0;
  double result = 0.0;
  printf("Enter two numbers(intervals): ");
  scanf("%d %d", &low, &high);
  printf("Armstrong numbers between %d and %d are: ", low, high);

  // iterate number from (low + 1) to (high - 1)
  // In each iteration, check if number is Armstrong
  for (number = low + 1; number < high; ++number) {
    originalNumber = number;

    // number of digits calculation
    while (originalNumber != 0) {
      originalNumber /= 10;
      ++count;
    }

    originalNumber = number;

    // result contains sum of nth power of individual digits
    while (originalNumber != 0) {
      rem = originalNumber % 10;
      result += pow(rem, count);
      originalNumber /= 10;
    }

    // check if number is equal to the sum of nth power of individual digits
    if ((int)result == number) {
      printf("%d ", number);
    }

    // resetting the values
    count = 0;
    result = 0;
  }

  return 0;
}
```

**Output:-**

```
Enter two numbers(intervals): 1
1000
Armstrong numbers between 1 and 1000 are: 2 3 4 5 6 7 8 9 153 370 371 407
```

**PRACTICAL-61**

**aim:-**WAP to add numbers until the user enters zero using while loop.

**input:-**

```
// C Program to add integers until user enters 0

#include <stdio.h>
int main()
{
    int num, sum = 0;
    do
    {
        printf("Enter a number: ");
        scanf("%d", &num);
        sum += num;

    }while(num != 0);

    printf("Total = %d",sum);
    return 0;
}
```

**Output:-**

```
Enter a number: 5
Enter a number: 18
Enter a number: 1
Enter a number: 0
Total = 24
```

**PRACTICAL-62**

**aim:-**WAP to find Sum of N input Numbers by user using for loop.

**input:-**

```
#include <stdio.h>

int main()
{
  int n, sum = 0, c, value;

  printf("How many numbers you want to add?\n");
  scanf("%d", &n);

  printf("Enter %d integers\n", n);

  for (c = 1; c <= n; c++)
  {
    scanf("%d", &value);
    sum = sum + value;
  }

  printf("Sum of the integers = %d\n", sum);

  return 0;
}
```

**Output:-**

```
How many numbers you want to add?
6
Enter 6 integers
1
2
3
4
5
6
Sum of the integers = 21
```

**PRACTICAL-63**

**aim:-**WAP to find sum of the square of all natural numbers from 1 to N. Series: 1^2+2^2+3^2+4^2+..N^2

**input:-**

```
#include <stdio.h>

int main()
{
   int i,n,sum=0;
   printf("Input the number of terms : ");
   scanf("%d",&n);
   printf("\nThe square natural upto %d terms are :",n);
   for(i=1;i<=n;i++)
   {
     printf("%d  ",i*i);
     sum+=i*i;
   }
   printf("\nThe Sum of Square Natural Number upto %d terms = %d \n",n,sum);
   return 0;
}
```

**Output:-**

```
Input the number of terms : 5

The square natural upto 5 terms are :1  4  9  16  25
The Sum of Square Natural Number upto 5 terms = 55
```

**PRACTICAL-64**

**aim:-**WAP to read an age of 10 person & find out how many of them fall under using while loop : a) Student- age 0 to 20 b) Doing College or job - age 21 to 50 c) Enjoy Retire life-age 51 & over

**input:-**

```
#include<stdio.h>
int main()
{
int age,student=0,college_or_job=0,retire_life_age=0;
int count=0,n;
printf("enter the valule:");
scanf("%d",&n);
while (count<n)
{
printf("enter age of person %d:",count+1);
scanf("%d",&age);
if(age>=0 && age<=20)
student++;
else if (age>=21 && age<=50)
college_or_job++;
else if (age<=51)
retire_life_age++;
count++;
}
printf("school age: %d\n",student);
printf("college or job : %d\n",college_or_job);
printf("retire life age : %d\n",retire_life_age);
return 0;
}
```

**Output:-**

```
enter the valule:5
enter age of person 1:23
enter age of person 2:12
enter age of person 3:1
enter age of person 4:51
enter age of person 5:30
school age: 2
college or job : 2
retire life age : 1
```

**PRACTICAL-65**

**aim:-**WAP to print Square, Cube and Square Root of all numbers from 1 to N using for loop.

**input:-**

```
#include<stdio.h>
int main()
{
    int x,n;
    printf("enter the value: ");
    scanf("%d",&n);
    printf("Number\tSquare\tCube\n");
    printf("========================\n");
    for(x=0; x<=n; x++)
        printf("%d\t%d\t%d\n", x, x*x, x*x*x);
    return 0;
}
```

**Output:-**

```
enter the value: 20
Number  Square  Cube
========================
0       0       0
1       1       1
2       4       8
3       9       27
4       16      64
5       25      125
6       36      216
7       49      343
8       64      512
9       81      729
10      100     1000
11      121     1331
12      144     1728
13      169     2197
14      196     2744
15      225     3375
16      256     4096
17      289     4913
18      324     5832
19      361     6859
20      400     8000
```