# Practical: 1

1. Draw Flow Chart and write algorithm to add two numbers.

**ALGORITHM:**

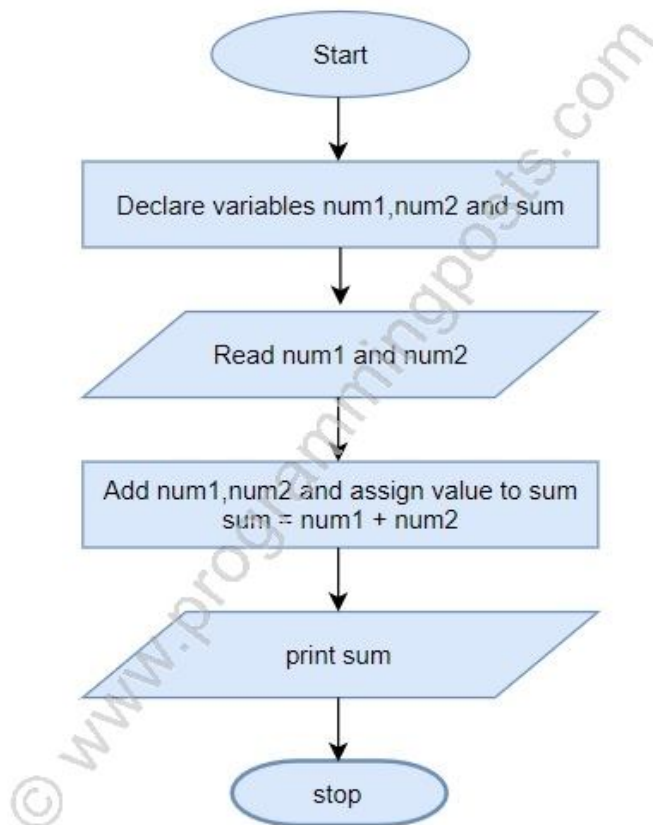Step 1: Start

Step 2: Declare variables num1, num2 and sum.

Step 3: Read values for num1, num2.

Step 4: Add num1 and num2 and assign the result to a variable sum.

Step 5: Display sum

Step 6: Stop

**FLOWCHART:**

2. Draw Flow Chart and write algorithm Convert Temperature from Fahrenheit (°F) to Celsius (°C).
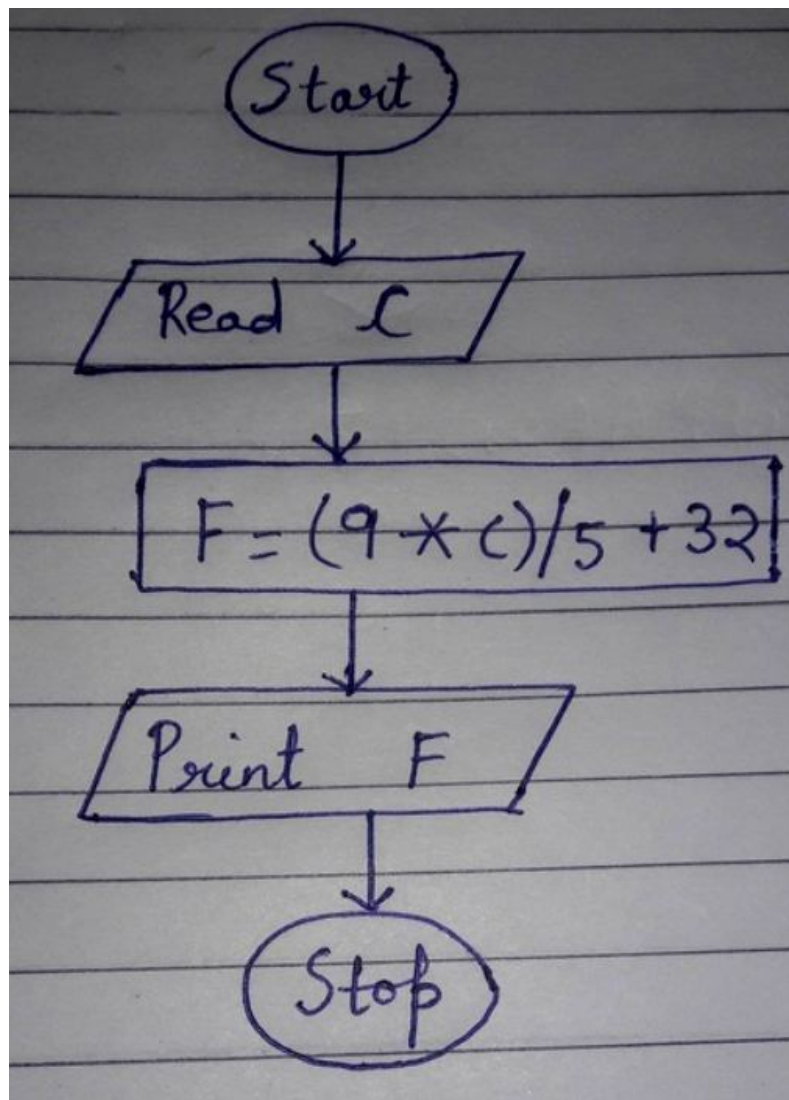
**ALGORITHM:**

Step 1: Start. Step

2: Read F.

Step 3: C=(5(F-32))/9.

Step 4: Print C.

Step 5: Stop.

**FLOWCHART:**

3. Draw Flow Chart and write algorithm to find maximum (or minimum) out of three numbers.
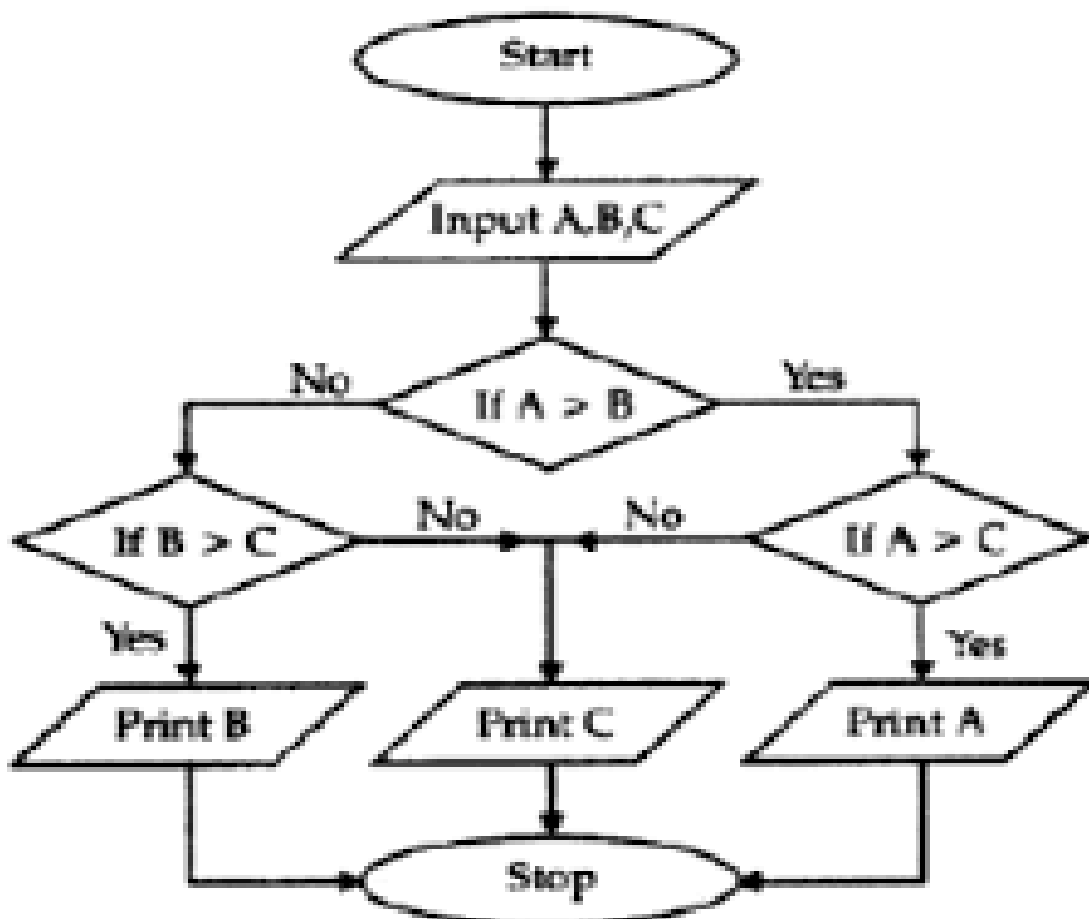   c).

**ALGORITHM:**

step1: Start

step2: Input A,B,C

step3: If (A>B) and (A>C) then print "A is greater".
    Else if (B>A) and (B>C) then print "B is greater".
    Else print "C is greater".

step4: Stop

**FLOWCHART:**

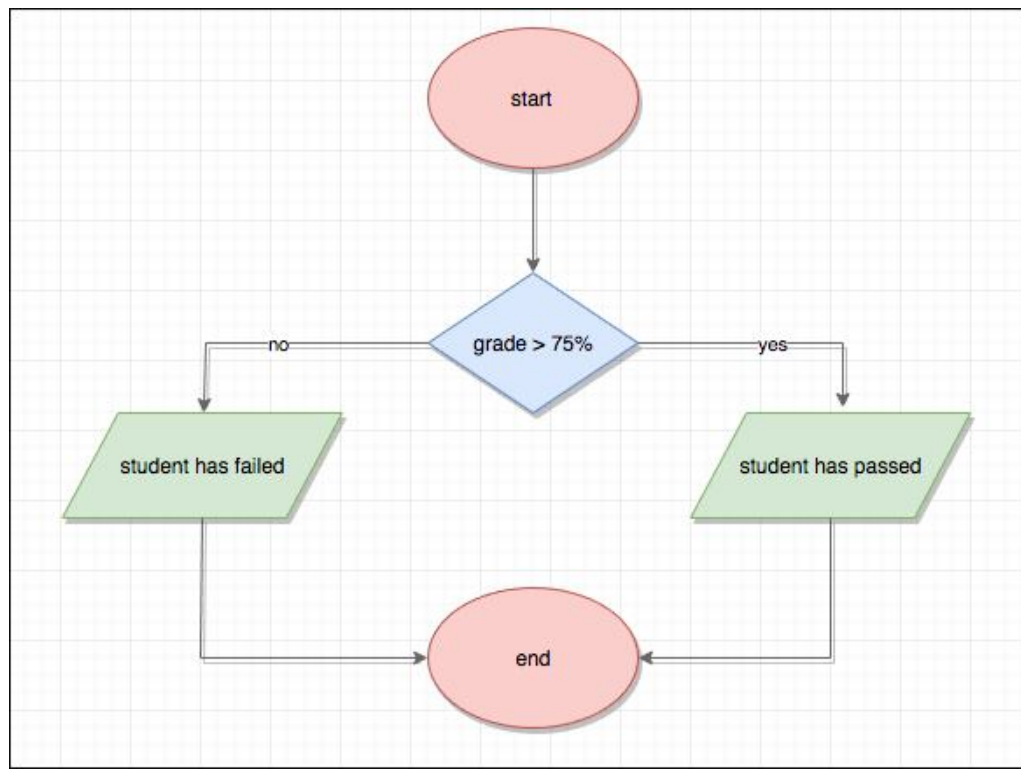4. Draw Flow Chart and write algorithm Whether A Student Passed the Exam or Not.

**ALGORITHM:**

Step 1: Input M1, M2, M3, M4

Step 2: GRADE = (M1+M2+M3+M4)/4

Step 3: if (GRADE < 60) then Print "FAIL" else Print "PASS" Endif

Step 4: Stop

**FLOWCHART:**

**5.Draw Flow Chart and write algorithm Calculate the Interest of a Bank Deposit.**

**ALGORITHM:**

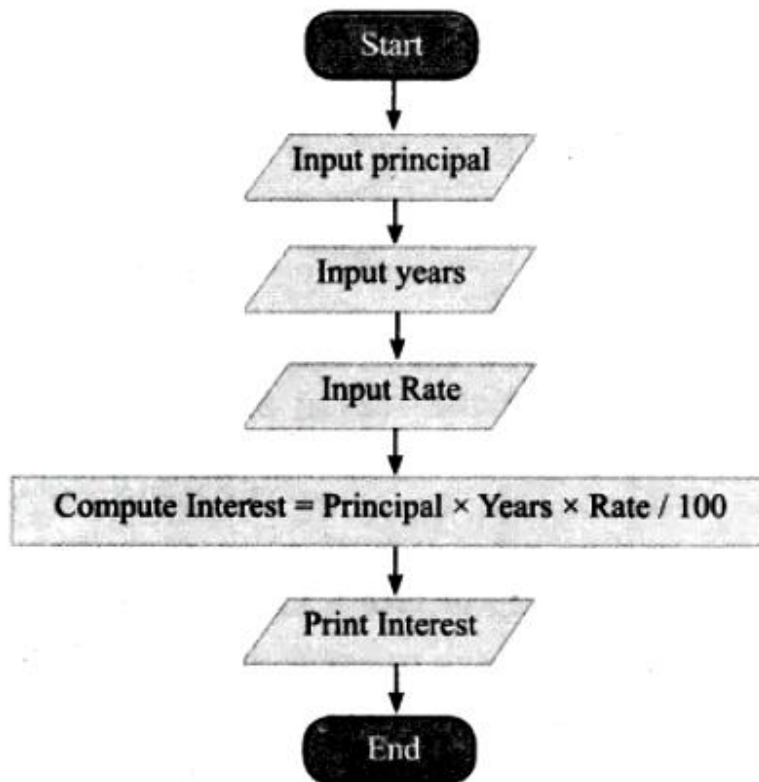1. **Draw flowchart that calculates the Interest of a Bank Deposit.**

   *Algorithm:*
   - Step 1: Read amount,
   - Step 2: Read years,
   - Step 3: Read rate,
   - Step 4: Calculate the interest with formula "Interest=Amount*Years*Rate/100
   - Step 5: Print interest.

**FLOWCHART:**

Start

Input principal

Input years

Input Rate

Compute Interest = Principal × Years × Rate / 100

Print Interest

End

# PRACTICAL – 2

1. Make C Program to display your Full Name on the monitor.

## PROGRAM:

```c
#include <stdio.h>

int main()

{

    // Write C code here

    printf("Padhiyar Divya Takhatsinh");

    return 0;

}
```

## OUTPUT:

Padhiyar Divya Takhatsinh

2. Perform the basic Arithmetic operation for the any two Numbers given by the User.

## PROGRAM:

```c
#include <stdio.h>
int main()
{
        int num1, num2;
        int sum, sub, mult, mod;
        float div;
         /*
        * Input two numbers from user
         */
    printf("Enter any two numbers: ");
    scanf("%d%d", &num1, &num2);

    /*
        * Perform all arithmetic operations
    */
    sum = num1 + num2;
    sub = num1 - num2;
```

```
    mult = num1 * num2;
    div = (float)num1 / num2;
    mod = num1 % num2;

    /*
     * Print result of all arithmetic operations
     */
    printf("SUM = %d\n", sum);
    printf("DIFFERENCE = %d\n", sub);
    printf("PRODUCT = %d\n", mult);
    printf("QUOTIENT = %f\n", div);
    printf("MODULUS = %d", mod);

    return 0;
}
```

## OUTPUT:

Enter any two numbers: 20 10

SUM = 30

DIFFERENCE = 10

PRODUCT = 200

QUOTIENT = 2.000000

MODULUS = 0

3. C Program to convert temperature from degree centigrade to Fahrenheit.

## PROGRAM:

```
#include <stdio.h>

int main()
{
    float celsius, fahrenheit;

    /* Input temperature in celsius */
    printf("Enter temperature in Celsius: ");
    scanf("%f", &celsius);

    /* celsius to fahrenheit conversion formula */
    fahrenheit = (celsius * 9 / 5) + 32;

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

    return 0;
}
```

**OUTPUT:**

Enter temperature in Celsius: 100

100.00 Celsius = 212.00 Fahrenheit

4. C Program to shows how to use const to declare constants of different data types.

**PROGRAM:**

```c
#include <stdio.h>

int main(void)

{

  const float pie = 3.14;

  const int radius = 6;

  printf("The radius of the circle is %d ",radius);

  float area = (float)(pie*radius*radius);

  printf("\nThe area of the given circle is %f", area);

  return 0;

}
```

**OUTPUT:**

The radius of the circle is 6

The area of the given circle is 113.040001

5. Make C Program to Calculate Area and Circumference of Circle.

**PROGRAM:**

```c
#include<stdio.h>

 int main()
```

```c
{
    int rad;

    float PI = 3.14, area, ci;

    printf("\nEnter radius of circle: ");

    scanf("%d", &rad);

    area = PI * rad * rad;

    printf("\nArea of circle : %f ", area);

    ci = 2 * PI * rad;

    printf("\nCircumference : %f ", ci);

    return (0);

}
```

## OUTPUT:

Enter radius of circle: 5

Area of circle : 78.500000

Circumference : 31.400002

6. C Program to Calculate Area of Scalene Triangle.

## PROGRAM:

```c
#include<stdio.h>

#include<math.h>

int main()
{
    int s1, s2, angle;
    float area;

    printf("\nEnter Side1 : ");
    scanf("%d", &s1);

    printf("\nEnter Side2 : ");
    scanf("%d", &s2);
```

```
        printf("\nEnter included angle : ");
        scanf("%d", &angle);

        area = (s1 * s2 * sin((M_PI / 180) * angle)) / 2;

        printf("\nArea of Scalene Triangle : %f", area);
        return (0);
}
```

## OUTPUT:

Enter Side1 : 5

Enter Side2 : 5

Enter included angle : 45

Area of Scalene Triangle : 8.838835

# PRACTICAL – 3

1. Write a C program to read two numbers and print the maximum and minimum of them.

## PROGRAM:

```
#include <stdio.h>

int main()
{
    int num1, num2;
printf("Enter two numbers: ");

scanf("%d%d", &num1, &num2);

if(num1 > num2)
    {
printf("%d is maximum", num1);
    }
```

```c
if(num2 > num1)
    {
printf("%d is maximum", num2);
    }


if(num1 == num2)
    {
printf("Both are equal");
    }

    return 0;
}
```

## OUTPUT:

```
Enter two numbers: 10
12
12 is maximum
```

**2. Write a C program to implement implicit type conversion.**

## PROGRAM:

```c
#include <stdio.h>

int main()
{
    float a = 12.3;

    int b = (int)a + 3; //typecasting float to int

printf("The value of b is: %d",b);


    return 0;
}
```

**OUTPUT:**

The value of b is: 15

**3. C Program to reverse a given number 1234.**

**PROGRAM:**

```c
#include <stdio.h>

intmain()
{
int n;
int dig, revNumber;

printf("Enter an integer number : ");
scanf("%d", &n);

   /*Reversing Number*/
revNumber = 0;

while (n >0) {
    dig = n % 10; /*get digit*/
revNumber = (revNumber * 10) + dig;
    n = n / 10;
   }

printf("Reverse Number is : %d\n", revNumber);
return0;
}
```

**OUTPUT:**

Enter an integer number : 1234
Reverse Number is : 4321


**4. C Program to Create Simple Calculator.**


## PROGRAM:

```c
#include <stdio.h>

int main()
{
    char op;
    float num1, num2, result=0.0f;

    /* Print welcome message */
    printf("WELCOME TO SIMPLE CALCULATOR\n");
    printf("----------------------------\n");
    printf("Enter [number 1] [+ - * /] [number 2]\n");

    /* Input two number and operator from user */
    scanf("%f %c %f", &num1, &op, &num2);

    /* Switch the value and perform action based on operator*/
    switch(op)
    {
        case '+':
            result = num1 + num2;
            break;

        case '-':
            result = num1 - num2;
            break;

        case '*':
            result = num1 * num2;
            break;
```

```c
        case '/':
            result = num1 / num2;
            break;

        default:
printf("Invalid operator");
    }

    /* Prints the result */
printf("%.2f %c %.2f = %.2f", num1, op, num2, result);

    return 0;
}
```

**OUTPUT**

```
Enter an operator (+, -, *,): *
Enter two operands: 1.5
4.5
1.5 * 4.5 = 6.8
```

# Practical: 4

1. Enter the birth year and check whether the person is born in leap year or not.

## PROGRAM:

```
#include<stdio.h>
#include<conio.h>
void main() {
    int year;
    printf("Enter a year: ");
    scanf("%d", &year);

    if(year%4 ==0)
    {
        printf("%d is a leap year", year);
    }
    else
    {
        printf("%d is not a leap year", year);
    }
    getch();
}
```

## OUTPUT:

```
Enter a year: 2012
2012 is a leap year
Enter a year: 2013
2013 is not a leap year
```

2. C Program to generate the Fibonacci Series starting from any two numbers.

## PROGRAM:

```c
#include<stdio.h>
int main()
{
        int n, firstnumber, secondnumber, sum;
        printf ("How many Fibonacci terms to display : ");
        scanf("%d", &n);
        printf("\n Give First Number : ");
        scanf("%d", &firstnumber);
        printf("\n Give Second Number : ");
        scanf("%d", &secondnumber);
        printf("\n The Fibonacci Series is . . . \n");
        printf("\n %d %d ", firstnumber, secondnumber);
        while (n>2){
        sum = firstnumber + secondnumber;
        printf("%d ", sum);
        firstnumber = secondnumber;
        secondnumber = sum;
        n--;
        }
    return (0);
        }
```

## OUTPUT:

How many Fibonacci terms to display : 7

 Give First Number : 2

 Give Second Number : 4
The Fibonacci Series is . . .
24 6 10 16 26 42

3. Write a program to input name, marks of 5 subjects of a student and display the name of the student, the total marks scored, percentage scored and the class of result.

## **PROGRAM:**

```c
#include <stdio.h>

int main()
{
    int  phy, chem, bio, math, comp;
    float per;

    /* Input marks of five subjects from user */
    printf("Enter five subjects marks: ");
    scanf("%d%d%d%d%d", &phy, &chem, &bio, &math, &comp);


    /* Calculate percentage */
    per = (phy + chem + bio + math + comp) / 5.0;

    printf("Percentage = %.2f\n", per);


    /* Find grade according to the percentage */
    if(per >= 90)
    {
        printf("Grade A");
    }
    else if(per >= 80)
    {
        printf("Grade B");
    }
    else if(per >= 70)
    {
        printf("Grade C");
    }
    else if(per >= 60)
    {
        printf("Grade D");
    }
    else if(per >= 40)
    {
        printf("Grade E");
    }
    else
    {
```

```
        printf("Grade F");
    }

    return 0;
}
```

## OUTPUT:

```
Enter five subjects marks: 50
30
40
60
80
Percentage = 52.00
Grade E
```

4. Write a C program which will invoke the command processor to execute a command.

## PROGRAM:

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

int main ()
{
        int x;

        printf ("\n\n Is command processor available?\n");
        if (system(NULL))
        {
                printf ("Command processor available!\n");
        }
        else
        {
                printf ("Command processor not available!\n");
                exit (1);
        }
        printf ("Executing command DIR\n");
        x=system ("dir");
        printf ("Returned value is: %d.\n",x);
        return 0;
}
```

## OUTPUT:

Is command processor available?

Command processor available!

Executing command DIR

Returned value is: 0.

# PRACTICAL 5

**1.Write a C program to read ages of two person and check whether they are of same age or not.**

**PROGRAM:**

```c
#include <stdio.h>
int main()
{
   int person1,person2;
   printf("Enter the age of person1:");
   scanf("%d",&person1);
   printf("Enter the age of person2:");
   scanf("%d",&person2);
   if(person1==person2)
   {
      printf("Both the Persons Age are Same");
   }
   else
   {
      printf("Both the Persons Age are not Same");
   }
   return 0;
}
```

**OUTPUT:**

Enter the age of person1:24
Enter the age of person2:23
Both the Persons Age are not Same

**2. Write a program to check whether two numbers are equal or not.**

**PROGRAM:**

```c
#include <stdio.h>
int main()
{
   int number1,number2;
   printf("Enter the value of number1:");
   scanf("%d",&number1);
   printf("Enter the value of number2:");
   scanf("%d",&number2);
```

```c
    if(number1==number2)
    {
      printf("Both the Numbers are Equal");
    }
    else
    {
      printf("Both the Numbers are Not Equal");
    }
    return 0;
}
```

**OUTPUT:**

Enter the value of number1:10
Enter the value of number2:10
Both the Numbers are Equal

## 3. Write a program to check whether a given number is greater or smaller.

**PROGRAM:**

```c
#include <stdio.h>
int main()
{
   int n1,n2;
   printf("Enter the value of n1:");
   scanf("%d",&n1);
   printf("Enter the value of n2:");
   scanf("%d",&n2);
   if(n1>n2)
   {
     printf("n1 is greater than n2");
   }
   else
   {
     printf("n2 is greater than n1");
   }
   return 0;
}
```

**OUTPUT:**

Enter the value of n1:20
Enter the value of n2:30
n2 is greater than n1

# 4. Write a program to print smallest number from 3 numbers.

**PROGRAM:**

```c
#include <stdio.h>
int main()
{
   int n1,n2,n3;
   printf("Enter the value of n1:");
   scanf("%d",&n1);
   printf("Enter the value of n2:");
   scanf("%d",&n2);
   printf("Enter the value of n3:");
   scanf("%d",&n3);
   if(n1<n2 && n1<n3)
   {
     printf("n1 is smaller");
   }
   else if(n2<n1 && n2<n3)
   {
     printf("n2 is smaller");
   }
   else
   {
     printf("n3 is smaller");
   }
   return 0;
}
```

**OUTPUT:**

Enter the value of n1:20
Enter the value of n2:10
Enter the value of n3:30
n2 is smaller

# PRACTICAL 6

## 1. Write a program to find the list of students having pass marks in both exams.

**PROGRAM:**

```c
#include <stdio.h>
int main()
{
 int marks[5],i,pass_count=0;
   printf("Enter marks of 5 students");
   for(i=0;i<5;i++){
     scanf("%d",&marks[i]);
     if(marks[i]>35)
        pass_count++;
   }
   printf("Count of failed students=%d",pass_count);
   return 0;
}
```

**OUTPUT:**

```
Enter marks of 5 students
90
80
70
10
20
Count of failed students=3
```

## 2. Write a program to perform bitwise operation on operands.

**PROGRAM:**

```c
#include <stdio.h>
int main()
{
 int a = 60;    /* 60 = 0011 1100 */
 int b = 13;    /* 13 = 0000 1101 */
 int c = 0;
 c = a & b;     /* 12 = 0000 1100 */
 printf("& Operation - Value of c is %d\n", c );
 c = a | b;     /* 61 = 0011 1101 */
 printf("| Operation - Value of c is %d\n", c );
 c = a ^ b;     /* 49 = 0011 0001 */
```

```c
  printf("^ Operation - Value of c is %d\n", c );
  c = ~a;        /*-61 = 1100 0011 */
  printf("~ Operation - Value of c is %d\n", c );
  c = a << 2;    /* 240 = 1111 0000 */
  printf("<< Operation  - Value of c is %d\n", c );
  c = a >> 2;    /* 15 = 0000 1111 */
  printf(">> Operation  - Value of c is %d\n", c );
   return 0;
}
```

## OUTPUT:

& Operation - Value of c is 12

| Operation - Value of c is 61

^ Operation - Value of c is 49

~ Operation - Value of c is -61

<< Operation  - Value of c is 240

>> Operation  - Value of c is 15

# 3. Write a program to Reverse a Given Number Using While Loop.

## PROGRAM:

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

## OUTPUT:

Enter an integer: 123

Reversed number = 321

## 4. Print Multiplication Table Using for Loop.

**PROGRAM:**

```c
#include <stdio.h>
int main() {
  int n, i;
  printf("Enter an integer: ");
  scanf("%d", &n);
  for (i = 1; i <= 10; ++i) {
    printf("%d * %d = %d \n", n, i, n * i);
  }
  return 0;
}
```

**OUTPUT:**

```
Enter an integer: 9
9 * 1 = 9
9 * 2 = 18
9 * 3 = 27
9 * 4 = 36
9 * 5 = 45
9 * 6 = 54
9 * 7 = 63
9 * 8 = 72
9 * 9 = 81
9 * 10 = 90
```

# PRACTICAL 7

## 1.Read the percentage of a student and check in which class he belongs: (1) distinction (2) first class (3) second class (4) fail. (using if-else ladder).

**PROGRAM:**

```c
#include <stdio.h>

int main()
{
```

```c
    int percentage;
    printf("Enter your percentage ");
    scanf("%d",&percentage);
    if(percentage<0 || percentage>100)
    {
        printf("Wrong Entry");
    }
    else if(percentage<50)
    {
        printf("Fail");
    }
    else if(percentage>=50 && percentage<70)
    {
        printf("Second Class");
    }
    else if(percentage>=70 && percentage<80)
    {
        printf("First Class");
    }
    else
    {
        printf("Distinction ");
    }
    return 0;
}
```

**OUTPUT:**

Enter your percentage 90
Distinction

## 2.C Program to Calculate Gross Salary of an Employee.

**PROGRAM:**

```c
#include <stdio.h>
int main()
{
    int gross_salary, basic, da, ta;
    printf("Enter basic salary : ");
    scanf("%d", &basic);
    da = (10 * basic) / 100;
```

```
  ta = (12 * basic) / 100;
  gross_salary = basic + da + ta;
  printf("\nGross salary : %d", gross_salary);
   return 0;
}
```

**OUTPUT:**

Enter basic salary : 10000
Gross salary : 12200

# PRACTICAL 8

**1.Write a C program to display 1 to N, read N from key board. (in same row and different rows, using all three loops)**

**PROGRAM:**

```
#include <stdio.h>
int main()
{
    int n,i;
   printf("Enter the value of n: ");
   scanf("%d",&n);
   printf("Using For Loop :");
   for(i=1;i<=n;i++){
      printf("%d  ",i);
   }
   i=1;
  printf("\n\nUsing While Loop :");
   while(i<=n)
   {
      printf("%d  ",i);
      i++;
   }
   i=1;
   printf("\n\nUsing Do While Loop :\n");
   do
   {
      printf("%d\n",i);
      i++;
   }while(i<=n);
     return 0;
```

```
   return 0;
}
```

**OUTPUT:**

Enter the value of n: 7
Using For Loop :1  2  3  4  5  6  7

Using While Loop :1  2  3  4  5  6  7

Using Do While Loop :
1
2
3
4
5
6
7

## 2. C program to add two numbers without using the addition operator.

**PROGRAM:**

```c
#include <stdio.h>
int main()
{
   int num1, num2, i;
   printf("enter first number: ");
   scanf("%d",&num1);
   printf("enter second number: ");
   scanf("%d",&num2);
   for(i=1;i<=num2;i++){
      num1++;
   }
   printf("sum = %d", num1);
   return 0;
}
```
**OUTPUT:**

enter first number: 30
enter second number: 20

sum=50

# PRACTICAL 9

**1.Write a C program to add first 10 numbers and display the summation, using loops.**

**PROGRAM:**

#include <stdio.h>

int main()

{

int  j, sum = 0;

printf("The first 10 natural number is :\n");

   for (j = 1; j <= 10; j++)

  {

     sum = sum + j;

printf("%d ",j);

  }

printf("\nThe Sum is : %d\n", sum);

}

**OUTPUT:**

The first 10 natural number is :

1 2 3 4 5 6 7 8 9 10

The Sum is : 55

## 2. C Program To Print Day of Week Name Using Switch Case.

**PROGRAM:**

```c
#include <stdio.h>

int main()

{

    int week;

    /* Input week number from user */

printf("Enter week number(1-7): ");

scanf("%d", &week);

    switch(week)

    {

        case 1:

printf("Monday");

            break;

        case 2:

printf("Tuesday");

            break;

        case 3:

printf("Wednesday");

            break;

        case 4:

printf("Thursday");

            break;

        case 5:
```

```c
printf("Friday");

        break;

    case 6:

printf("Saturday");

        break;

    case 7:

printf("Sunday");

        break;

    default:

printf("Invalid input! Please enter week number between 1-7.");

    }

    return 0;

}
```

**OUTPUT:**

Enter week number(1-7): 1

Monday

**3.To check for equality of two numbers without using arithmetic or comparison operator.**

**PROGRAM:**

```c
#include <stdio.h>

int checkForEquality(int x, int y) {

return !(x ^ y);

}

int main(void)

{
```

```c
    int x = 10, y = 10;

    if (checkForEquality(x, y)) {

printf ("x=%d is equal to y=%d\n", x, y);

    }

    else {

printf ("x=%d is not equal to y=%d\n", x, y);

}

    return 0;

}
```

**OUTPUT:**

x=10 is equal to y=1

# PRACTICAL 10

**1.Write programs using While Loop and Do-while loop.**

**PROGRAM:(Using while loop)**

```c
#include <stdio.h>

int main()

{

    int i=0;

    while(i==1)

    {

        printf("while vs do-while");

    }

printf("Out of loop");

}
```

**OUTPUT:**

Out of loop

**PROGRAM:(using do-while loop)**

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

**OUTPUT:**

Enter a number: 5

5

10

15

20

25

30

35

40

45

50

## 2.Write a program to display terms of Fibonacci series.

**PROGRAM:**

```c
#include<stdio.h>
int main()
{
 int n1=0,n2=1,n3,i,number;
printf("Enter the number of elements:");
scanf("%d",&number);
printf("\n%d %d",n1,n2);//printing 0 and 1
 for(i=2;i<number;++i)//loop starts from 2 because 0 and 1 are already printed
 {
  n3=n1+n2;
printf(" %d",n3);
  n1=n2;
  n2=n3;
 }
 return 0;
}
```

**OUTPUT:**

Enter the number of elements:10

0 1 1 2 3 5 8 13 21 34

## 3. Write a program to check whether the given number is prime or not

**PROGRAM:**

```c
#include <stdio.h>

int main()

{

  int n, i, flag = 0;

printf("Enter a positive integer: ");

scanf("%d", &n);

  // 0 and 1 are not prime numbers

  // change flag to 1 for non-prime number

  if (n == 0 || n == 1)

    flag = 1;

  for (i = 2; i<= n / 2; ++i)

{

    // if n is divisible by i, then n is not prime

    // change flag to 1 for non-prime number

    if (n % i == 0)

 {

      flag = 1;

      break;

    }

  }

  // flag is 0 for prime numbers

  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: 3

3 is a prime number.

Enter a positive integer: 6

6 is not a prime number.

# PRACTICAL 11

**1.Write a C Program to Calculate Sum & Average of an Array.**

**PROGRAM:**

#include <stdio.h>

int main()

{

 int n, i;

 float num[100], sum = 0.0, avg;

 printf("Enter the numbers of elements: ");

scanf("%d", &n);

 while (n > 100 || n < 1) {

printf("Error! number should in range of (1 to 100).\n");

```c
printf("Enter the number again: ");

scanf("%d", &n);

    }

for (i = 0; i< n; ++i) {

printf("%d. Enter number: ", i + 1);

scanf("%f", &num[i]);

    sum += num[i];

    }

    avg = sum / n;

printf("Average = %.2f", avg);

    return 0;

}
```

**OUTPUT:**

Enter the numbers of elements: 10

1. Enter number: 2

2. Enter number: 3

3. Enter number: 4

4. Enter number: 3

5. Enter number: 3

6. Enter number: 4

7. Enter number: 6

8. Enter number: 7

9. Enter number: 9

10. Enter number: 8

Average = 4.90

## 2.Write a C Program to sort values in an array.

**PROGRAM:**

```c
#include <stdio.h>
 void swap(int* xp, int* yp)
{
    int temp = *xp;
    *xp = *yp;
    *yp = temp;
}
// Function to perform Selection Sort
void selectionSort(int arr[], int n)
{
    int i, j, min_idx;
    // One by one move boundary of unsorted subarray
    for (i = 0; i< n - 1; i++) {
        // Find the minimum element in unsorted array
min_idx = i;
        for (j = i + 1; j < n; j++)
            if (arr[j] <arr[min_idx])
min_idx = j;
        // Swap the found minimum element
        // with the first element
        swap(&arr[min_idx], &arr[i]);
    }
```

```c
}

// Function to print an array
void printArray(int arr[], int size)
{
    int i;
    for (i = 0; i< size; i++)
printf("%d ", arr[i]);
printf("\n");
}

// Driver code
int main()
{
    int arr[] = { 0, 23, 14, 12, 9 };
    int n = sizeof(arr) / sizeof(arr[0]);
printf("Original array: \n");
printArray(arr, n);
selectionSort(arr, n);
printf("\nSorted array in Ascending order: \n");
printArray(arr, n);
    return 0;
}
```

**OUTPUT:**

Original array:

0 23 14 12 9

Sorted array in Ascending order:

0 9 12 14 23

## 3.Write a C Program to merge two arrays.

**PROGRAM:**

```c
#include <stdio.h>

int main()

{

    int arr1size = 5, arr2size = 5, arr_resultsize, i, j;


    // elements of first Array

    int a[5] = { 1, 2, 3, 4, 5 };


    // elements of Second Array

    int b[5] = { 6, 7, 8, 9, 10 };


    // resultant Array Size Declaration

arr_resultsize = arr1size + arr2size;

    int c[arr_resultsize];


    // copying array 1 elements into an array

    for (i = 0; i< arr1size; i++) {

        c[i] = a[i];

    }
```

```c
    // copying array 2 elements into an array

    for (i = 0, j = arr1size;

        j <arr_resultsize&&i< arr2size; i++, j++) {

        c[j] = b[i];

    }


    // Array Elements After Merging

    for (i = 0; i<arr_resultsize; i++) {

printf("%d ", c[i]);

    }

    return 0;

}
```

**OUTPUT:**

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

**4.Write a C Program to find a particular value in an array.**

**PROGRAM:**

```c
#include <stdio.h>

 #include <conio.h>

int main()

{

    int a[10000],i,n,key;

printf("Enter size of the  array : ");

scanf("%d", &n);

printf("Enter elements in array : ");
```

```c
for(i=0; i<n; i++)
   {
scanf("%d",&a[i]);
   }
printf("Enter the key : ");
scanf("%d", &key);
for(i=0; i<n; i++)
   {
      if(a[i]==key)
      {
                  printf("element found ");
         return 0;
      }
   }

      printf("element  not  found");
}
```

**OUTPUT:**

Enter size of the  array: 5

Enter elements in array: 4

6

2

1

3

Enter the key: 2

element found

# PRACTICAL 12

## 1.Write a C program to find the factorial of given number.

**PROGRAM:**

```c
#include <stdio.h>
// Function to find factorial
// of given number
unsigned int factorial(unsigned int n)
{
 if (n == 0)
  return 1;
 return n * factorial(n - 1);
}
 // Driver code
int main()
{
 int num = 5;
printf("Factorial of %d is %d",
   num, factorial(num));
 return 0;
}
```

**OUTPUT:**

Factorial of 5 is 120

## 2. C program to read string with spaces using scanf() function.

**PROGRAM:**

#include <stdio.h>

int main()

{

    char name[30];

    printf("Enter name: ");

    scanf("%[^\n]",name);


    printf("Name is: %s\n",name);

    return 0;

}

**OUTPUT:**

Enter name: HP

Name is: HP

# PRACTICAL 13

## 1. Write a C programs to make pattern using nested loop.
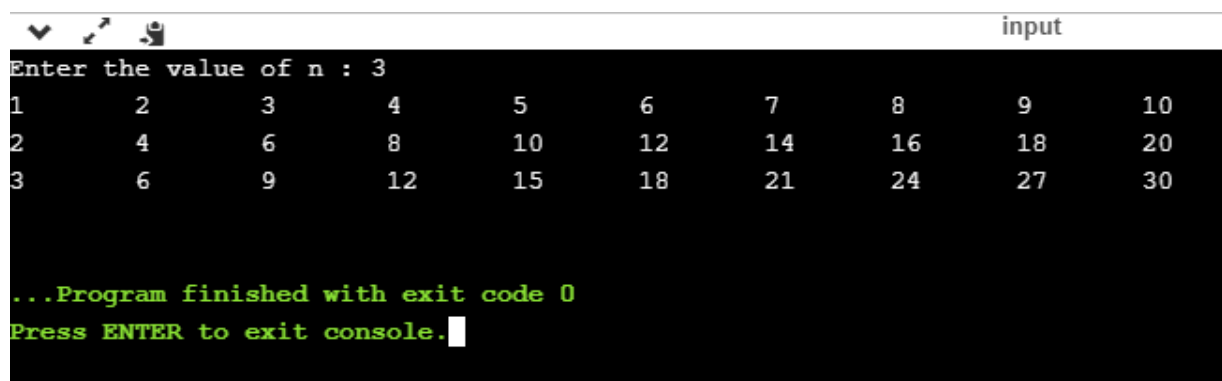
**PROGRAM:**

```
#include <stdio.h>
int main()
{
  int n;// variable declaration
 printf("Enter the value of n :");
 // Displaying the n tables.
```

```
 for(int i=1;i<=n;i++)  // outer loop
{
for(int j=1;j<=10;j++)  // inner loop
{
        printf("%d\t",(i*j)); // printing the value.
}
printf("\n");
 }
```

**OUTPUT:**

```
                                                    input
Enter the value of n : 3
1       2       3       4       5       6       7       8       9       10
2       4       6       8       10      12      14      16      18      20
3       6       9       12      15      18      21      24      27      30


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

2. **Write a program to illustrate the use of unary prefix and postfix increment and decrement operators.**

**PROGRAM:**

```
#include <stdio.h>

#include <conio.h>

int main ()

{

// declare integer variables

int x, y, z;

printf (" Input the value of X: ");
```

```c
        scanf (" %d", &x);

        printf (" Input the value of Y: ");

        scanf (" %d", &y);

        printf (" Input the value of Z: ");

        scanf (" %d", &z);

        printf (" Input the value of a: ");

        scanf (" %d", &a);

        // use pre increment operator to update the value by 1

        ++x;

        ++y;

        --z;

         a--;

        printf (" \n The updated value of the X: %d ", x);

        printf (" \n The updated value of the Y: %d ", y);

        printf (" \n The updated value of the Z: %d ", z);

        printf (" \n The updated value of the Z: %d ", a);

        return 0;

        }
```

**OUTPUT:**

Input the value of X: 10

Input the value of Y: 20

Input the value of Z: 30

Input the value of a: 40

The updated value of the X: 11

 The updated value of the Y: 21

The updated value of the Z: 29

The updated value of the Z: 39

# PRACTICAL 14

**1. Write a C program to read height of ten students and count the number of odd height and even height students.**

**PROGRAM:**

```c
#include <stdio.h>

struct student {
    char firstName[50];
    int roll;
    float marks;
} s[5];

int main() {
    int i;
    printf("Enter information of students:\n");

    // storing information
    for (i = 0; i < 5; ++i) {
        s[i].roll = i + 1;
        printf("\nFor roll number%d,\n", s[i].roll);
        printf("Enter first name: ");
        scanf("%s", s[i].firstName);
        printf("Enter marks: ");
```

```c
        scanf("%f", &s[i].marks);
    }
    printf("Displaying Information:\n\n");


    // displaying information
    for (i = 0; i < 5; ++i) {
        printf("\nRoll number: %d\n", i + 1);
        printf("First name: ");
        puts(s[i].firstName);
        printf("Marks: %.1f", s[i].marks);
        printf("\n");
    }
    return 0;
}
```

**OUTPUT:**

Enter information of students:


For roll number1,

Enter first name: hp

Enter marks: 20

For roll number2,

Enter first name: dp

Enter marks: 30

For roll number3,

Enter first name: am

Enter marks: 55

For roll number4,

Enter first name: kr

Enter marks: 96

For roll number5,

Enter first name: kp

Enter marks: 77

Displaying Information:


Roll number: 1

First name: hp

Marks: 20.0


Roll number: 2

First name: dp

Marks: 30.0


Roll number: 3

First name: am

Marks: 55.0


Roll number: 4

First name: kr

Marks: 96.0

Roll number: 5

First name: kp

Marks: 77.0

## 2. .Write a program to check number is Armstrong or not.

**PROGRAM:**

```c
#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 contains the last digit
        remainder = originalNum % 10;

        result += remainder * remainder * remainder;

        // removing last digit from the orignal number
        originalNum /= 10;
    }

    if (result == num)
```

```c
        printf("%d is an Armstrong number.", num);

    else

        printf("%d is not an Armstrong number.", num);


    return 0;

}
```

**OUTPUT:**

Enter a three-digit integer: 32

32 is not an Armstrong number.

Enter a three-digit integer: 371

371 is an Armstrong number.

# PRACTICAL 15

**1. Write a C program to find maximum (or minimum) element from 1-D array having N elements.**

**PROGRAM:**

```c
#include <stdio.h>

int main() {

 int n;

 double arr[100];

 printf("Enter the number of elements (1 to 100): ");

 scanf("%d", &n);


 for (int i = 0; i < n; ++i) {

  printf("Enter number%d: ", i + 1);

  scanf("%lf", &arr[i]);
```

```c
    }


    // storing the largest number to arr[0]

    for (int i = 1; i < n; ++i) {

      if (arr[0] < arr[i]) {

        arr[0] = arr[i];

      }

    }


    printf("Largest element = %.2lf", arr[0]);


    return 0;

}
```

**OUTPUT:**

Enter the number of elements (1 to 100): 5

Enter number1: 34.5

Enter number2: 2.4

Enter number3: -35.5

Enter number4: 38.7

Enter number5: 24.5

Largest element = 38.70


## 2. Program in C to print the number pyramid pattern.

**PROGRAM:**

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

```c
int main() {
    int i, space, rows, k = 0, count = 0, count1 = 0;
    printf("Enter the number of rows: ");
    scanf("%d", &rows);
    for (i = 1; i <= rows; ++i) {
        for (space = 1; space <= rows - i; ++space) {
            printf("  ");
            ++count;
        }
        while (k != 2 * i - 1) {
            if (count <= rows - 1) {
                printf("%d ", i + k);
                ++count;
            } else {
                ++count1;
                printf("%d ", (i + k - 2 * count1));
            }
            ++k;
        }
        count1 = count = k = 0;
        printf("\n");
    }
    return 0;
}
```

**OUTPUT:**

Enter the number of rows: 5

            1

          2 3 2

        3 4 5 4 3

      4 5 6 7 6 5 4

    5 6 7 8 9 8 7 6 5


## 3. Program in C to print the Number Diamond Pattern.

### PROGRAM:

#include <stdio.h>


int main()

{

  int n, c, k, space = 1;


  printf("Enter number of rows\n");

  scanf("%d", &n);


  space = n - 1;


  for (k = 1; k <= n; k++)

  {


    for (c = 1; c <= space; c++)

    printf(" ");

```c
        space--;

        for (c = 1; c <= 2*k-1; c++)

        printf("*");

        printf("\n");

    }
    space = 1;

    for (k = 1; k <= n - 1; k++)
    {

        for (c = 1; c <= space; c++)
        printf(" ");

        space++;

        for (c = 1 ; c <= 2*(n-k)-1; c++)
        printf("*");

        printf("\n");
    }
```

return 0;

}

**OUTPUT:**

```
Output

/tmp/xGTt2vErVd.o
Enter number of rows
5
      *
    ***
   *****
  *******
*********
  *******
   *****
    ***
      *
```