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PROGRAM-1(a)

OBJECTIVE: PROGRAM TO ADD TWO NUMBERS

LANGUAGE USED: C

THEORY: TWO VARIABLES ARE DECLARED AS INTEGERS AND INPUT IS TAKEN. SUM OF THESE TWO VARIABLES IS GIVEN USING A THIRD VARIABLE.

INPUT

```
/*CS
PROGRAM TO ADD TWO NUMBERS
9-Sep-2020
By DRISHTI ARORA */

#include <stdio.h>
int main()
{
   int a,b,c
   printf("Enter two numbers:");
   scanf("%d %d", &a, &b);

   c=a+b;
   printf("Sum of the given numbers is %d",c);
   return 0;
}
```

OUTPUT

```
Enter two numbers:2
3
Sum of the given numbers is 5
… Program finished with exit code 0
Please ENTER to exit console.
```

main.c

```c
/*CS
PROGRAM TO ADD TWO NUMBERS
9-Sep-2020
By DRISHTI ARORA */

#include <stdio.h>

int main()
{
    int a,b,c;

    printf("Enter two numbers:");
    scanf("%d %d", &a, &b);

    c=a+b;
    printf("Sum of the given numbers is %d",c);

    return 0;
}
```

input

```
Enter two numbers:2
3
Sum of the given numbers is 5

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

PROGRAM-1(b)

OBJECTIVE: PROGRAM TO ADD THREE NUMBERS

LANGUAGE USED: C

THEORY: THREE VARIABLES ARE DECLARED AS INTEGERS AND INPUT IS TAKEN. SUM OF THESE THREE VARIABLES IS GIVEN USING A FOURTH VARIABLE.

INPUT

```
/*CS
PROGRAM TO ADD THREE NUMBERS
9-Sep-2020
By DRISHTI ARORA */
#include <stdio.h>
int main()
{
   int a,b,c,d ;
   printf("Enter three numbers:");
   scanf("%d %d %d %d", &a, &b, &c, &d);

   d=a+b+c;
   printf("Sum of the given numbers is %d",d);

   return 0;
}
```

OUTPUT

```
Enter three numbers:1
2
3
Sum of the given numbers is 6

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

main.c

```c
/*CS
PROGRAM TO ADD THREE NUMBERS
9-Sep-2020
By DRISHTI ARORA */

#include <stdio.h>

int main()
{
    int a,b,c,d ;

    printf("Enter three numbers:");
    scanf("%d %d %d", &a, &b, &c);

    d=a+b+c;
    printf("Sum of the given numbers is %d",d);

    return 0;
}
```

input

```
Enter three numbers:1
2
3
Sum of the given numbers is 6

...Program finished with exit code 0
```

PROGRAM-2(a)

OBJECTIVE: PROGRAM TO FIND AREA OF THE CIRCLE

LANGUAGE USED: C

THEORY: THREE VARIABLES(r, area,pi=3.14) ARE DECLARED THEN USING THE MATHEMATICAL FORMULA, ar=pi*r*r, AREA IS CALCULATED.

INPUT

```
/*CS
PROGRAM TO FIND AREA OF THE CIRCLE
9-Sep-2020
By DRISHTI ARORA */
#include <stdio.h>

float ar, pi=3.14;
void main ()
{
   int r ;

   printf("Enter the radius:");
   scanf("%d", &r);

   ar=pi*r*r;
   printf("The area of the circle is: %f",ar);

}
```

OUTPUT

```
Enter the radius:1
The area of the circle is: 3.140000

… Program finished with exit code 35
Please ENTER to exit console.
```

```c
/*CS
PROGRAM TO FIND AREA OF THE CIRCLE
9-Sep-2020
By DRISHTI ARORA */

#include <stdio.h>

float ar, pi=3.14;

void main ()
{
    int r ;

    printf("Enter the radius:");
    scanf("%d", &r);

    ar=pi*r*r;
    printf("The area of the circle is: %f",ar);

}
```

input

```
Enter the radius:1
The area of the circle is: 3.140000

...Program finished with exit code 35
Press ENTER to exit console.
```

PROGRAM-2(b)

OBJECTIVE: PROGRAM TO FIND SIMPLE INTEREST

LANGUAGE USED: C

THEORY: FOUR VARIABLES(p, r, t, interest) ARE DECLARED AND INPUT IS TAKEN FROM THE USER. FORMULA FOR SIMPLE INTEREST USED IS interest=(p*r*t)/100

INPUT

```
/*CS
PROGRAM TO FIND SIMPLE INTEREST
9-Sep-2020
By DRISHTI ARORA */


#include <stdio.h>
int main()
{
int p,r,t,interest;
   printf("Enter principle amount, rate of interest and time to find simple interest \n");
   scanf("%d %d %d", &p, &r, &t);
   interest=(p*r*t)/100;
   printf("The simple interest is: %d",interest);
   return 0;
}
```

OUTPUT

```
Enter principle amount, rate of interest and time to find simple interest
1000 5 2
The simple interest is: 100
… Program finished with exit code 0
Please ENTER to exit console.
```

main.c

```c
/*CS
PROGRAM TO FIND SIMPLE INTEREST
9-Sep-2020
By DRISHTI ARORA */

#include <stdio.h>

int main()
{
int p,r,t,interest;

    printf("Enter principle amount, rate of interest and time to find simple interest \n");
    scanf("%d %d %d", &p, &r, &t);

    interest=(p*r*t)/100;
    printf("The simple interest is: %d",interest);

    return 0;
}

```

input

```
Enter principle amount, rate of interest and time to find simple interest
1000 5 2
The simple interest is: 100

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

PROGRAM-3

OBJECTIVE: Program to print a block F using hash (#), where the F has a height of six characters and width of five and four characters.

LANGUAGE USED: C

THEORY: WE USE printf STATEMENT TO DISPLAY LETTER F AND USE \n TO GO TO THE NEXT LINE.

INPUT

```
/*CS
Program to print a block F using hash (#), where the F has a height of six characters and
width of five and four characters.
16-Sep-2020
By DRISHTI ARORA */

#include <stdio.h>
int main()
{
   printf("#####""\n");
   printf("#""\n");
   printf("####""\n");
   printf("#""\n");
   printf("#""\n");
   printf("#""\n");
   return 0;
}
```

OUTPUT

```
#####
#
####
#
#
… Program finished with exit code 0
Please ENTER to exit console.
```

main.c

```c
/*CS
Program to print a block F using hash (#), where the F has a height of six characters and
width of five and four characters.
16-Sep-2020
By DRISHTI ARORA */

#include <stdio.h>
int main()
{
    printf("#####""\n");
    printf("#""\n");
    printf("####""\n");
    printf("#""\n");
    printf("#""\n");
    printf("#""\n");
    return 0;
}
```

input

```
#####
#
####
#
#
#
```

PROGRAM-4

OBJECTIVE: Program that accepts two item’s weight (floating points' values) and number of purchase (floating points' values) and calculate the average value of the items.

LANGUAGE USED: C

THEORY: FOUR VARIABLES(a, b, p, q) ARE DECLARED TO TAKE THE REQUIRED INPUT.av IS CALCULATED BY THE FORMULA av=(a*p+b*q)/(p+q)

INPUT

```
/*CS
Program that accepts two item’s weight (floating points' values) and number of purchase

(floating points' values) and calculate the average value of the items.
16-Sep-2020
By DRISHTI ARORA */
#include <stdio.h>
int main()
{
   float a,b,p,q,av;
   printf("Weight of two items are:");
   scanf("%f%f",&a,&b);
   printf("Number of purchase are:");
   scanf("%f%f",&p,&q);
   av=(a*p+b*q)/(p+q);
   printf("average is: %f",av);
   return 0;
}
```

OUTPUT

```
Weight of two items:2.5
2.5
Number of purchase are:2
2
average is 2.500000
… Program finished with exit code 0
Please ENTER to exit console.
```

main.c

```c
(floating points' values) and calculate the average value of the items.
16-Sep-2020
By DRISHTI ARORA */

#include <stdio.h>

int main()
{
    float a,b,p,q,av;
    printf("Weight of two items are:");
    scanf("%f%f",&a,&b);

    printf("Number of purchase are:");
    scanf("%f%f",&p,&q);

    av=(a*p+b*q)/(p+q);
    printf("average is: %f",av);


    return 0;
}
```

input

```
Number of purchase are:2
2
average is: 2.500000

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

PROGRAM-5(a)

OBJECTIVE: PROGRAM TO SWAP TWO NUMBERS USING A THIRD VARIABLE

LANGUAGE USED: C

THEORY: INPUT OF TWO VARIABLES IS TAKEN AND ARE SWAPPED BY STORING THE FIRST VARIABLE AND THEN IT IS OVERWRITTEN BY SECOND VARIABLE AND THE SECOND VARIABLE IS GIVEN THE VALUE OF FIRST VARIABLE USING THE THIRD VARIABLE

INPUT

```
/*CS
PROGRAM TO SWAP TWO NUMBERS
9-Sep-2020
By DRISHTI ARORA */
#include <stdio.h>
int main()
{
int x,y;
   printf("Enter value of x \n");
   scanf("%d", &x);
   printf("Enter value of y \n");
   scanf("%d", &y);
   int temp=x;
   x=y;
   y=temp;
   printf("After swapping, x=%d, y=%d", x, y);
   return 0;
}
```

OUTPUT

```
Enter the value of x
1
Enter the value of y
18
After swapping, x=18, y=1
… Program finished with exit code 0
Please ENTER to exit console.
```

main.c

```c
/* By DRISHTI ARORA */

#include <stdio.h>

int main()
{
int x,y;

    printf("Enter value of x \n");
    scanf("%d", &x);

    printf("Enter value of y \n");
    scanf("%d", &y);

    int temp=x;
    x=y;
    y=temp;
    printf("After swapping, x=%d, y=%d", x, y);

    return 0;
}
```

input

```
Enter value of x
1
Enter value of y
18
After swapping, x=18, y=1
```

PROGRAM-5(b)

OBJECTIVE: Program to swap two variables without using a third variable

LANGUAGE USED: C

INPUT

```
/*CS
Program to swap two variables without using a third variable
16-Sep-2020
By DRISHTI ARORA*/
#include<stdio.h>

int main()
{
   int a,b;
   printf("Enter the Number to be Swapped....");
   scanf("%d %d",&a,&b);
   printf("Before swap a=%d b=%d\n",a,b);

   a=a*b;
   b=a/b;
   a=a/b;
   printf("\nAfter swap a=%d b=%d",a,b);
      return 0;
}
```

OUTPUT

```
Enter the Number to be Swapped....1 2
Before swap a=1 b=2

After swap a=2 b=1
… Program finished with exit code 0
Please ENTER to exit console.
```

```c
#include<stdio.h>

int main()
{
    int a,b;

    printf("Enter the Number to be Swapped....");
    scanf("%d %d",&a,&b);

    printf("Before swap a=%d b=%d\n",a,b);

    a=a*b;
    b=a/b;
    a=a/b;

    printf("\nAfter swap a=%d b=%d",a,b);

    return 0;
}
```

input

```
Enter the Number to be Swapped....1 2
Before swap a=1 b=2

After swap a=2 b=1

...Program finished with exit code 0
```

PROGRAM-6(a)

OBJECTIVE: Program to convert a given integer (in seconds) to hours, minutes, and seconds.

LANGUAGE USED: C

THEORY: INPUT IS TAKEN IN SECONDS. IT IS DIVIDED BY 3600 TO CALCULATE NUMBER OF HOURS. THE REMAINDER IS DIVIDED BY 60 TO CALCULATE THE NUMBER OF MINUTES. THEN THE LEFTOVER IS THE NUMBER OF SECONDS

INPUT

```
/*CS
Program to convert a given integer (in seconds) to hours, minutes, and seconds.
16-Sep-2020
By DRISHTI ARORA */
#include <stdio.h>

int main()
{
  int sec, hours, minutes, seconds;
     printf("enter time in seconds");
   scanf("%d", &sec);

   hours=sec/3600;
   minutes=(sec-hours*3600)/60;
   seconds=sec-hours*3600-minutes*60;
   printf("hours:minutes:seconds\n%d:%d:%d",hours,minutes,seconds);
   return 0;
}
```

OUTPUT

```
Enter time in seconds6330
hours:minutes:seconds
1:45:30
… Program finished with exit code 0
Please ENTER to exit console.
```

main.c

```c
/*CS
Program to convert a given integer (in seconds) to hours, minutes, and seconds.
16-Sep-2020
By DRISHTI ARORA */

#include <stdio.h>
int main()
{
   int sec, hours, minutes, seconds;
      printf("enter tym in seconds");
    scanf("%d", &sec);

    hours=sec/3600;
    minutes=(sec-hours*3600)/60;
    seconds=sec-hours*3600-minutes*60;
    printf("hours:minutes:seconds\n%d:%d:%d",hours,minutes,seconds);
    return 0;
}
```

input

```
enter tym in seconds6330
hours:minutes:seconds
1:45:30

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

PROGRAM-6(b)

OBJECTIVE: Program to convert specified days into years, weeks, and days.

LANGUAGE USED: C

THEORY: INPUT IS TAKEN IN THE FORM OF DAYS. INPUT IS DIVIDED BY 365 TO OBTAIN THE NUMBER OF YEARS. THEN THE REMAINDER IS DIVIDED BY 7 TO GET THE NUMBER OF WEEKS. THE LEFTOVER ARE THE DAYS.

INPUT

```
/*CS
Program to convert specified days into years, weeks, and days.
16-Sep-2020
By DRISHTI ARORA */
#include <stdio.h>
int main()
{
  int totaldays, years, weeks, days;
     printf("enter total days ");
   scanf("%d", &totaldays);

  years=totaldays/365;
   weeks=(totaldays-years*365)/7;
   days=totaldays-years*365-weeks*7;
   printf("years,weeks,days\n%d,%d,%d",years,weeks,days);
    return 0;
}
```

OUTPUT

```
Enter totaldays 1329
Years, weeks, days
3, 33, 3
… Program finished with exit code 0
Please ENTER to exit console.
```

main.c

```c
/*CS
Program to convert specified days into years, weeks, and days.
16-Sep-2020
By DRISHTI ARORA */

#include <stdio.h>
int main()
{
   int totaldays, years, weeks, days;
      printf("enter totaldays ");
    scanf("%d", &totaldays);

   years=totaldays/365;
    weeks=(totaldays-years*365)/7;
    days=totaldays-years*365-weeks*7;
    printf("years,weeks,days\n%d,%d,%d",years,weeks,days);
      return 0;
}
```

input

```
enter totaldays 1329
years,weeks,days
3,33,3

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

PROGRAM-6(c)

OBJECTIVE: PROGRAM TO CHECK WHETHER NUMBER IS ODD OR EVEN.

LANGUAGE USED: C

THEORY: INPUT IS TAKEN AS AN INTEGER. SINCE THE EVEN NUMBERS ARE DIVISIBLE BY 2, WE USE IF AND ELSE STATEMENTS TO CHECK WHETHER THE GIVEN INTEGER IS EVEN OR ODD.

INPUT

```
/*CS
PROGRAM TO CHECK WHETHER NUMBER IS ODD OR EVEN.
23-Sep-2020
By DRISHTI ARORA */
#include <stdio.h>
int main()
{
   int num;
   printf("Enter a number ");
   scanf("%d", &num);
   if (num % 2 == 0)
   {
      printf("%d is an even number.", num);
   }
   else
   {
      printf("%d is an odd number.", num);
   }
   return 0;
}
```

OUTPUT

```
Enter a number 65
65 is an odd number.
… Program finished with exit code 0
Please ENTER to exit console.
```

main.c

```c
/*CS
PROGRAM TO CHECK WHETHER NUMBER IS ODD OR EVEN.
23-Sep-2020
By DRISHTI ARORA */

#include <stdio.h>
int main()
{
    int num;
    printf("Enter a number ");
    scanf("%d", &num);
    if (num % 2 == 0)
    {
        printf("%d is an even number.", num);
    }
    else
    {
        printf("%d is an odd number.", num);
    }
    return 0;
}

```

input

```
Enter a number 65
65 is an odd number.

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

PROGRAM-7

OBJECTIVE: Program to check whether a given year is Leap year or not.

LANGUAGE USED: C

THEORY:A LEAP YEAR IS DIVISIBLE BY 4AND IF IT IS A CENTURY YEAR, IT MUST BE DIVISIBLE BY 400. BY USING IF A ND ELSE STATEMENTS, WE CHECK WHETHER THE GIVEN INPUT YEAR IS A LEAP YEAR OR NOT.

INPUT

```
/*CS
Program to check whether a given year is Leap year or not.
23-Sep-2020
By DRISHTI ARORA */
#include <stdio.h>
int main()
{
   int year;
   printf("Enter the year");
   scanf("%d", &year);
   if (year %400 ==0)
   {
      printf("%d is a leap year", year);    }
   else if (year%100==0)
   {
      printf("%d is not a leap year", year);     }
   else if (year%4==0)
   {
      printf("%d is a leap year", year);     }
   else
   {
   printf("%d is not a leap year", year);   }
   return 0;
 }
```

OUTPUT

```
Enter the year2100
2100 is not a leap year
… Program finished with exit code 0
Please ENTER to exit console.
```

main.c

```c
#include <stdio.h>
int main()
{
    int year;
    printf("Enter the year");
    scanf("%d", &year);
    if (year %400 ==0)
    {
        printf("%d is a leap year", year);
    }
    else if (year%100==0)
    {
        printf("%d is not a leap year", year);
    }
    else if (year%4==0)
    {
        printf("%d is a leap year", year);
        }
    else
    {
    printf("%d is not a leap year", year);
    }
```

input

```
Enter the year2100
2100 is not a leap year

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

PROGRAM-8(a)

OBJECTIVE: Program to check whether the given sides make a triangle which is Equilateral, Isosceles, or Scalene triangle.

LANGUAGE USED: C

THEORY: AN EQUILATERAL, ISOSCELES AND SCALENE TRIANGLE HAVE 3, 2, AND 0 SIDES EQUAL REPECTIVELY. WE USE IF AND ELSE STATEMENTS TO CHECK HOW MANY SIDES ARE EQUAL AND HENCE SPECIFY THE TYPE OF TRIANGLE.

INPUT

```
/*CS
Program to check whether the given sides make a triangle which is Equilateral, Isosceles, or Scalene triangle.
23-Sep-2020
By DRISHTI ARORA */
#include <stdio.h>
int main()
{   int side1, side2, side3;
   printf("Enter the sides of the triangle");
   scanf("%d%d%d", &side1, &side2, &side3);
   if (side1==side2 && side2==side3)
   {
      printf("The given triangle is an equilateral triangle.");
   }
   else if (side1==side2||side2==side3||side1==side3)
   {
      printf("The given triangle is an isosceles triangle.");
   }
   else
   {
      printf("The given triangle is a scalene triangle.");
   }
   return 0; }
```

OUTPUT

```
Enter the sides of the triangle2 4 4
The given triangle is an isosceles triangle.
… Program finished with exit code 0
Please ENTER to exit console.
```

main.c

```c
/* Program to check whether the given sides make a triangle which is Equilateral, Isosceles, or Scalene triangle.
23-Sep-2020
By DRISHTI ARORA */

#include <stdio.h>
int main()
{
    int side1, side2, side3;
    printf("Enter the sides of the triangle");
    scanf("%d%d%d", &side1, &side2, &side3);
    if (side1==side2 && side2==side3)
    {
        printf("The given triangle is an equilateral triangle.");
    }
    else if (side1==side2||side2==side3||side1==side3)
    {
        printf("The given triangle is an isoscles triangle.");
    }
    else
    {
        printf("The given triangle is a scalene triangle.");
    }
```

input

```
Enter the sides of the triangle2
4
4
The given triangle is an isoscles triangle.

...Program finished with exit code 0
```

PROGRAM-8(b)

OBJECTIVE: TO CHECK WHETHER A TRIANGLE IS RIGHT-ANGLED, OBTUSE OR ACUTE TRIANGLE.

LANGUAGE USED: C

THEORY: A RIGHT-ANGLED TRIANGLE HAS ONE OF ITS ANGLE EQUAL TO 90 DEGREES. AN OBTUSE ANGLED TRIANGLE HAS ANGLE GREATER THAN 90 DEGREES. AN ACUTE-ANGLED TRIANGLE HAS AN ANGLE LESS THAN 90 DEGREES. IF AND ELSE STATEMENTS ARE USED TO CHECK THE TYPE OF THE TRIANGLE BASED ON ITS PROPERTIES. IN CASE THE GIVEN ANGLES DO NOT FORM A TRIANGLE(SUM IS NOT EQUAL TO 180 DEGREES), IT WILL BE DISPLAYED.

INPUT

```
/*CS
Program to check whether a triangle is right angles, obtuse, acute triangle.
23-Sep-2020
By DRISHTI ARORA */
#include <stdio.h>
int main()
{
   int a,b,c;
   printf("Enter the angles");
   scanf("%d%d%d", &a, &b, &c);
   if (a+b+c==180)
   {
      if (a==90||b==90||c==90)
      {
         printf("The triangle is a right angled triangle.");
      }
      else if (a>90||b>90||c>90)
      {
         printf("The triangle is an obtuse angled triangle.");
      }
      else if (a<90||b<90||c<90)
      {
         printf("The triangle is an acute angled triangle.");
```

```
        }
        else
        {
            printf("The given angles will not form a triangle");
        }
    }
    return 0;
}
```

OUTPUT

```
Enter the angles30
60
90
The triangle is a right angled triangle.
… Program finished with exit code 0
Please ENTER to exit console.
```

main.c

```c
{
    int a,b,c;
    printf("Enter the angles");
    scanf("%d%d%d", &a, &b, &c);

    if (a+b+c==180)
    {
        if (a==90||b==90||c==90)
        {
            printf("The triangle is a right angled triangle.");
        }
        else if (a>90||b>90||c>90)
        {
            printf("The triangle is an obtuse angled triangle.");
        }
        else if (a<90||b<90||c<90)
        {
            printf("The triangle is an acute angled triangle.");
        }
        else
        {
            printf("The given angles will not form a triangle");
```

input

```
Enter the angles30
60
90
The triangle is a right angled triangle.

...Program finished with exit code 0
```

PROGRAM-9

OBJECTIVE: Program to covert temperature from Fahrenheit to Celsius and Celsius to Fahrenheit.

LANGUAGE USED: C

THEORY: CHOICE IS GIVEN TO THE USER TO SELECT THE CONVERSION. DEPENDING ON THE CHOICE MADE, TEMPERTAURE FROM ONE UNIT IS CONVERTED FROM ONE UNIT TO OTHER USING MATHEMATICAL FORMULAE.

INPUT

```
/*CS
Program to covert temperature from Fahrenheit to Celsius and Celsius to Fahrenheit.
(User must provide the choice of type of temperature)
23-Sep-2020
By DRISHTI ARORA*/

#include <stdio.h>
int main()
{
   int num,n;
   float c,f;
   printf("enter choice:\n1:C->F\n2:F->C\n");
   scanf("%d",&n);
   if(n==1)
   {
   printf("enter temp in cel:");
   scanf("%f",&c);
   f = (c * 9 / 5) + 32;
   printf("%f Celsius = %f Fahrenheit", c, f);
   }
   else if(n==2)
   {
   printf("Enter a temp in fah: ");
   scanf("%f", &f);

   c = (5.0/9) * (f - 32);
   printf("%f Celsius = %f Fahrenheit", c, f);
```

```
    }
    else
    {
    printf("invalid input");
    }
}
```

OUTPUT

```
enter choice
1:C->F
2:F->C
1
enter temp in cel :0
0.000000 Celsius = 32.000000 Fahrenheit
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
int num,n;
float c,f;
printf("enter choice:\n1:C->F\n2:F->C\n");
scanf("%d",&n);
if(n==1)
{
printf("enter temp in cel:");
scanf("%f",&c);
f = (c * 9 / 5) + 32;
printf("%f Celsius = %f Fahrenheit", c, f);
}
else if(n==2)
{
printf("Enter a temp in fah: ");
scanf("%f", &f);

c = (5.0/9) * (f - 32);
printf("%f Celsius = %f Fahrenheit", c, f);
}
else
{
printf("invalid input");
```

input

```
enter choice:
1:C->F
2:F->C
1
enter temp in cel:0
0.000000 Celsius = 32.000000 Fahrenheit
```

PROGRAM-10(a)

OBJECTIVE: TO CHECK WHETHER A CHARACTER IS AN ALPHABET OR DIGIT

LANGUAGE USED: C

THEORY: ASCII VALUES ARE USED TO CHECK WHETHER THE GIVEN CHARACTER IS AN ALAPHABET OR DIGIT. IF AND ELSE STATEMENTS ARE USED.

INPUT

```
/*CS
TO CHECK WHETHER A CHARACTER IS AN ALPHABET OR DIGIT
23-Sep-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   char character ;
   printf("Enter a character:");
   scanf("%c", &character);
   if (character>='a' && character<='z'||character>='A' && character<='Z')
     {
      printf("The character %c is an alphabet.", character);
     }
   else if (character>='0' && character<='9')
     {
        printf("The character %c is a digit.", character);
     }
   return 0;
}
```

OUTPUT

```
Enter a character:F
The character F is an alphabet.
… Program finished with exit code 0
Please ENTER to exit console.
```

main.c

```c
/*CS
TO CHECK WHETHER A CHARACTER IS AN ALPHABET OR DIGIT
23-Sep-2020
By DRISHTI ARORA*/

#include <stdio.h>
int main()
{
    char character ;
    printf("Enter a character:");
    scanf("%c", &character);

    if (character>='a' && character<='z'||character>='A' && character<='Z')
       {
        printf("The character %c is an alphabet.", character);
       }
    else if (character>='0' && character<='9')
       {
          printf("The character %c is a digit.", character);
       }
    return 0;
}
```

input

```
Enter a character:F
The character F is an alphabet.

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

PROGRAM-10(b)

OBJECTIVE: TO CHECK WHETHER THE GIVEN ALPHABET IS A VOWEL OR A CONSONANT.

LANGUAGE USED: C

THEORY: INPUT IS TAKEN. IF AND ELSE STATEMENTS ARE USED TO DIFFERENTIATE BETWEEN VOWELS AND CONSONANTS.

INPUT

```
/*CSE
TO CHECK WHETHER THE GIVEN ALPHABET IS A VOWEL OR A CONSONANT.
23-Sep-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   char character;
   printf("Enter an alphabet: ");
   scanf("%c",&character);

   if(character=='a'||character=='A'||character=='e'||character=='E'||character=='i'||character=='I'
   ||character=='o'||character=='O'||character=='u'||character=='U')
   {
         printf("%c is a vowel", character);
   }
   else
   {
      printf("%c is a Consonant", character);
   }
   return 0;
}
```

OUTPUT

```
Enter an alphabet: U
U is a vowel
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c F9

```c
/*CSE
TO CHECK WHETHER THE GIVEN ALPHABET IS A VOWEL OR A CONSONANT.
23-Sep-2020
By DRISHTI ARORA*/

#include <stdio.h>

int main()
{
    char character;

    printf("Enter an alphabet: ");
    scanf("%c",&character);

    if(character=='a'||character=='A'||character=='e'||character=='E'||character=='i'||character=='I'
    ||character=='o'||character=='O'||character=='u'||character=='U')
    {
        printf("%c is a vowel", character);
    }
    else
    {
        printf("%c is a Consonant", character);
```

input

```
Enter an alphabet: U
U is a vowel

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

PROGRAM-11(a)

OBJECTIVE: TO CHECK WHICH NUMBER IS SMALLER OF THE TWO NUMBERS

LANGUAGE USED: C

THEORY: INPUT OF TWO INTEGERS IS TAKEN. IF AND ELSE STATEMENTS ARE USED. IF FIRST STATEMENT IS TRUE, THEN IF COMMAND IS EXECUTED. IF NOT, CONTROL SHIFTS TO THE NEXT STATEMENT AND ELSE STATEMENT IS EXECUTED. IN CASE BOTH ARE FALSE, NUMBERS ARE EQUAL.

INPUT

```
/*CS
TO CHECK WHICH NUMBER IS SMALLER OF THE TWO NUMBERS
23-Sep-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int a, b;
   printf("Enter TWO numbers");
   scanf("%d  %d", &a, &b);
   if(a>b)
   {
      printf("%d is smaller", b);
   }
   else  if (a<b)
   {
      printf("%d is smaller", a);
   }
   else
{
Printf(“%d and %d are equal”, a, b);
}
{
   return 0;
```

```
}
```

OUTPUT

```
Enter two numbers 2 3
2 is smaller
… Program finished with exit code 0
Please ENTER to exit console.
```

main.c

```c
/*TO CHECK WHICH NUMBER IS SMALLER OF THE TWO NUMBERS
23-Sep-2020
By DRISHTI ARORA*/

#include <stdio.h>
int main()
{
    int a, b;
    printf("Enter TWO numbers");
    scanf("%d  %d", &a, &b);

    if(a>b)
    {
        printf("%d is smaller", b);
    }
    else  if (a<b)
    {
        printf("%d is smaller", a);
    }
    else
{
    printf("%d and %d are equal", a, b);
```

input

```
Enter TWO numbers 2 3
2 is smaller

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

PROGRAM-11(b)

OBJECTIVE: TO CHECK WHICH NUMBER IS LARGEST AMONG THE THREE ENTERED NUMBERS

LANGUAGE USED: C

THEORY: INPUT OF THREE INTEGERS IS TAKEN. IF AND ELSE STATEMENTS ARE USED. IF THE FIRST STATEMENT IS TRUE, IT GOES IN THE NESTED LOOP AND CHECK FOR THE CORRECT CASE. IF THE STATEMENT IS FALSE, CONTROL SHIFTS TO THE NEXT STATEMENT.

LOGICAL OPERATORS ARE ALSO USED.

INPUT

```
/*CS
TO CHECK WHICH NUMBER IS LARGEST AMONG THE THREE ENTERED NUMBERS
23-Sep-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int a, b, c;
   printf("Enter three numbers");
   scanf("%d %d %d", &a, &b, &c);
   if(a>b && a>c)
   {
      printf("%d is largest", a);
   }
   else if (b>a && b>c)
   {
      printf("%d is largest", b);
   }
   else if(c>a && c>b)
   {
      printf("%d is largest", c);
   }
   else
   {
         printf("%d, %d and %d are equal", a , b, c);
   {
```

```
    return 0;
}
```

OUTPUT

```
Enter three numbers -1 2 9
9 is largest
… Program finished with exit code
Please ENTER to exit console.
```

main.c

```c
int main()
{
    int a, b, c;
    printf("Enter three numbers");
    scanf("%d %d %d", &a, &b, &c);

    if(a>b && a>c)
    {
        printf("%d is largstr", a);
    }
    else if (b>a && b>c)
    {
        printf("%d is largest", b);
    }
    else if(c>a && c>b)
    {
        printf("%d is largest", c);
    }
    else
    {
    printf("%d, %d and %d are equal", a , b, c);
    }
```

input

```
Enter three numbers -1 2 9
9 is largest

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

PROGRAM-12

OBJECTIVE: TO IMPLEMENT A SIMPLE CALCULATOR.

LANGUAGE USED: C

THEORY: To implement a simple calculator, the values are of two operands are taken as input from the user. The choice of operation is taken as input from the user and we apply operations as per. As per the choice, operations are executed.Result is printed with an appropriate message displayed.

INPUT

```
/*CSE
Program to make a simple calculator
30-Sep-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int a,b;
   float c;
   int choice;
   printf("Enter the first number\n");
   scanf("%d", &a);
   printf("Enter the second number\n");
   scanf("%d", &b);

   printf("Enter the choice as per operation as per the following directions\n");
   printf("Enter 1: for addition\n");
   printf("Enter 2: for subtraction\n");
   printf("Enter 3: for multiplication\n");
   printf("Enter 4: for division\n");
   printf("Enter 5: for modulo\n");
   printf("Enter 6: for exit\n");
   scanf("%d", &choice);
   switch(choice)
```

```
  {
    case 1:
        c=a+b;
        printf("The sum of %d and %d is %f\n", a,b,c);
        break;
    case 2:
        c=a-b;
        printf("The difference of %d and %d is %f\n", a,b,c);
        break;
    case 3:
        c=a*b;
        printf("The product of %d and %d is %f\n", a,b,c);
        break;
    case 4:
        c=a/b;
        printf("The quotient of %d and %d is %f\n", a,b,c);
        break;
    case 5:
        c=a%b;
        printf("The quotient of %d and %d is %f", a,b,c);
        break;
    case 6:
        printf("Select another choice");
        break;
  }
  return 0;
}
```

OUTPUT

```
Enter the first number
3
Enter the second number
3
Enter the choice as per operation as per the following directions
Enter 1: for addition
```

Enter 2: for subtraction

Enter 3: for multiplication

Enter 4: for division

Enter 5: for modulo

Enter 6: for exit

3

The product of 3 and 3 is 9.000000

…Program finished with exit code 0

Press ENTER to exit console.

main.c

```c
int main()
{
    int a,b;
    float c;
    int choice;

    printf("Enter the first number\n");
    scanf("%d", &a);
    printf("Enter the second number\n");
    scanf("%d", &b);

    printf("Enter the choice as per operation as per the following directions\n");
    printf("Enter 1: for addition\n");
    printf("Enter 2: for subtraction\n");
    printf("Enter 3: for multiplication\n");
    printf("Enter 4: for division\n");
    printf("Enter 5: for modulo\n");
    printf("Enter 6: for exit\n");
    scanf("%d", &choice);

    switch(choice)
```

input

```
Enter the first number
3
Enter the second number
3
Enter the choice as per operation as per the following directions
Enter 1: for addition
```

main.c

```
31              c=a+b;
32              printf("The sum of %d and %d is %f\n", a,b,c);
33              break;
34          case 2:
35              c=a-b;
36              printf("The difference of %d and %d is %f\n", a,b,c);
37              break;
38          case 3:
39              c=a*b;
40              printf("The product of %d and %d is %f\n", a,b,c);
41              break;
42          case 4:
43              c=a/b;
44              printf("The quotient of %d and %d is %f\n", a,b,c);
45              break;
46          case 5:
47              c=a%b;
48              printf("The quotient of %d and %d is %f", a,b,c);
49              break;
50          case 6:
51              printf("Select another choice");
```

input

```
Enter 3: for multiplication
Enter 4: for division
Enter 5: for modulo
Enter 6: for exit
3
The product of 3 and 3 is 9.000000
```

PROGRAM-13

OBJECTIVE: PROGRAM TO CALCULATE THE ROOTS OF A QUADRATIC EQUATION.

LANGUAGE USED: C

THEORY: Coefficients of the quadratic equation are taken by the user by scanf function.

discriminant=b*b-4*a*c

Using the property, whether discriminant is greater than, equal to or less than zero, if and else statements are used to obtain the roots of the equation.

INPUT

```
/*CSE
Program to calculate the roots of an equation.
07-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
#include <math.h>
int main()
{
   float a,b,c,discriminant,root1,root2;

   printf("Enter a, b, c i.e. coefficients of quadratic equation");
   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("root1=%f, root2=%f", root1, root2);
   }
   else if (discriminant==0)
   {
      root1==root2==-b/2*a;
      printf("root1=root2=%f", root1);
```

```
    }
    else
    {
        printf("roots are imaginary");
    }
    return 0;
}
```

OUTPUT

```
Enter a, b, c i.e. coefficients of quadratic equation1 2 1
root1=root2=-2.000000
…Program finished with exit code 0
Press ENTER to exit console.
```

```
9       printf("Enter a, b, c i.e. coefficients of quadratic equation");
10      scanf("%f%f%f",&a,&b,&c);
11
12      discriminant=b*b-4*a*c;
13
14      if (discriminant>0)
15
16      {
17          root1==(-b+sqrt(discriminant))/2*a;
18          root2==(-b-sqrt(discriminant))/2*a;
19          printf("root1=%f, root2=%f", root1, root2);
20      }
21      else if (discriminant==0)
22
23      {
24          root1==root2==-b/2*a;
25          printf("root1=root2=%f", root1);
26      }
27      else
28
29      {
30          printf("roots are imaginary");
```

input

```
Enter a, b, c i.e. coefficients of quadratic equation 1 2 1
root1=root2=0.000000

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

PROGRAM-14

OBJECTIVE: PROGRAM TO ACCEPT A COORDINATE AND LOCATE THE QUADRANT OF IT.

LANGUAGE USED: C

THEORY: To find in which quadrant a cartesian point lies, the abscissa and the ordinate are taken from the user as input. Coordinate's location is checked using if and else statements.
origin. If any of the conditions is false, the following conditions are checked.

(1.) x>0,y>0 ->I quadrant
(2.) x<0,y>0 ->II quadrant
(3.) x<0,y<0 ->III quadrant
(4.)x>0,y<0 ->IV quadrant

INPUT

```
/*CSE
Program to locate the quadrant of given coordintaes
30-Sep-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   float x,y;
   printf("Enter the values of x and y");
   scanf("%f %f", &x,&y);
   if (x>0 && y>0)
   printf("I quadrant");
   else if (x<0 && y>0)
   printf("II quadrant");
   else if (x<0 && y<0)
   printf("III quarant");
   else
   printf("IV quadrant");
   return 0;
}
```

OUTPUT

```
Enter the values of x and y -2-2
```

-2-2

III quadrant

…Program finished with exit code 0

Press ENTER to exit console.

main.c

```c

#include <stdio.h>

int main()

{
    float x,y;
    printf("Enter the values of x and y");
    scanf("%f %f", &x,&y);

    if (x>0 && y>0)
    printf("I quadrant");
    else if (x<0 && y>0)
    printf("II quadrant");
    else if (x<0 && y<0)
    printf("III quarant");
    else
    printf("IV quadrant");

    return 0;
}

```

input

```
Enter the values of x and y-2 -2
III quarant

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

PROGRAM-15

OBJECTIVE: Program to find gross salary of employee if DA is 40% of basic Salary and HRA is 20% of basic salary

LANGUAGE USED: C

THEORY: Basic salary is taken as input from the user. Then HRA and DA are calculated by:

da = 0.4*basic_salary

hra=0.2*basic_salary

Gross salary is calculated by :

gross_salary = basic_salary+da+hra

INPUT

```
/*CSE
Program to find gross salary of employee if DA is 40% of basic Salary and HRA is 20% of basic salary
30-Sep-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
 float basic_salary, gross_salary, da, hra;
   printf("Enter basic salary of an employee: ");
   scanf("%f", &basic_salary);

   da = 0.4*basic_salary;
   hra=0.2*basic_salary;
   gross_salary = basic_salary+da+hra;
  printf("Your gross salary is %f.", gross_salary);
   return 0;
}
```

OUTPUT

```
Enter basic salary of an employee: 50000
Your gross salary is 80000.000000.
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c

#include <stdio.h>

int main()
{

 float basic_salary, gross_salary, da, hra;

    printf("Enter basic salary of an employee: ");
    scanf("%f", &basic_salary);

    da = 0.4*basic_salary;
    hra=0.2*basic_salary;

    gross_salary = basic_salary+da+hra;

  printf("Your gross salary is %f.", gross_salary);


    return 0;
}

```

input

```
Enter basic salary of an employee: 10000
Your gross salary is 16000.000000.

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

PROGRAM-16

OBJECTIVE: PROGRAM TO CALCULATE ELECTRICITY BILL UNDER GIVEN CONSTRAINTS.

LANGUAGE USED: C

THEORY: Details like customer's name, customer's id and units consumed are taken from the user as input.

INPUT

```
/*CSE
Program to calculate electricity bill under given constraints
30-Sep-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   char customer_name[20];
   int units, customer_id;
   float bill, surcharge;
   printf("Enter customer name\n");
   scanf("%s", customer_name);
   printf("Enter customer id\n");
   scanf("%d", &customer_id);
   printf("Enter the units\n");
   scanf("%d",&units);
   if (units<=199)
   {
         bill=units*1.2;
            if (bill<100)
            {
            bill=100;
            printf("Bill is Rs. 100");
            }
            else
            {
            printf("Bill is %f",bill);
```

```
            }
    }
    else if (units<=500)
    {
            bill=(1.2*199+(units-199)*1.8);
            if (bill>400)
            {
            surcharge=bill*1.15;
            printf("Bill is %f",surcharge);
            }
            else
            {
            surcharge=bill;
            printf("Bill:%f",surcharge);
            }
    }
    else if (units>500)
    {
       bill=((1.2*199)+(1.8*301)+((units-500)*2));
            if (bill>400)
            {
            surcharge=bill*1.15;
            printf("Bill is %f",surcharge);
            }
            else
            {
            surcharge=bill;
            printf("Bill is %f",surcharge);
            }
    }
    return 0;
}
```

OUTPUT

```
Enter customer name
```

drishti

Enter customer id

108

Enter the units

400

Bill is 690.689941

…Program finished with exit code 0

Press ENTER to exit console.

main.c

```c
    char customer_name[20];
    int units, customer_id;
    float bill, surcharge;

    printf("Enter customer name\n");
    scanf("%s", &customer_name);
    printf("Enter customer id\n");
    scanf("%d", &customer_id);
    printf("Enter the units\n");
    scanf("%d",&units);

    if (units<=199)
    {
            bill=units*1.2;
                if (bill<100)
                {
                bill=100;
                printf("Bill is Rs. 100");
                }
                else
                {
                printf("Bill is %f",bill);
```

input

```
Enter customer name
drishti
Enter customer id
108
Enter the units
400
```

main.c

```c
    else if (units<=500)
    {
                bill=(1.2*199+(units-199)*1.8);
                if (bill>400)
                {
                surcharge=bill*1.15;
                printf("Bill is %f",surcharge);
                }
                else
                {
                surcharge=bill;
                printf("Bill:%f",surcharge);
                }
    }
    else if (units>500)
    {
        bill=((1.2*199)+(1.8*301)+((units-500)*2));
                if (bill>400)
                {
                surcharge=bill*1.15;
                printf("Bill is %f",surcharge);
                }
```

input

```
nter the units
00
ill is 690.689941

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

PROGRAM-17

OBJECTIVE: PROGRAM TO CALCULATE THE FINE UNDER GIVEN CONSTRAINTS

LANGUAGE USED: C

THEORY:

INPUT

```
/*CSE
Program to calculate fine with given conditions
30-Sep-2020
By DRISHTI ARORA*/
#include<stdio.h>
int main()
{
   int days;
   float fine;
   printf("Enter the number of days the book was delayed");
   scanf("%d", &days);
   if (days<=5)
   {fine=(days*0.5);
   printf("fine is %f", fine);   }
   else if(days<=10)
   {fine=(2.5+(1*(days-5)));
   printf("fine is %f", fine);       }
   else if(days<=30)
   {fine=(7.5+ 5*(days-10));
   printf("fine is %f", fine);    }
   else
   {printf("Since your fine is pending for more than 30 days so your membership is cancelled. Pay fine of Rs. 107.5");}
   return 0; }
```

OUTPUT

```
Enter the number of days the book was delayed 20
fine is 57.500000
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
    int days;
    float fine;

    printf("Enter the number of days the book was delayed");
    scanf("%d", &days);

    if (days<=5)
    {fine=(days*0.5);
    printf("fine is %f", fine);
    }
    else if(days<=10)
    {fine=(2.5+(1*(days-5)));
    printf("fine is %f", fine);
    }
    else if(days<=30)
    {fine=(7.5+ 5*(days-10));
    printf("fine is %f", fine);
    }
    else
    {printf("Since your fine is pending for more than 30 days so your membership is cancelled. Pay fine of Rs. 107.5
    return 0;
```

input

```
Enter the number of days the book was delayed20
fine is 57.500000

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

PROGRAM-18

OBJECTIVE: PROGRAM TO FIND FACTORIAL OF A GIVEN NUMBER.

LANGUAGE USED: C

THEORY: The number of whose factorial is to be calculated is taken as input from the user.

n!= 1*2*3*…*n

for loop is used to calculate factorial and the result is displayed.

INPUT

```
/*CSE
Program to find the factorial of a given number
07-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int n, i;
   long int fact=1;
   printf("Enter the number for calculation of factorial");
   scanf("%d", &n);
   if (n==0)
   {
      printf ("The factorial is 0");
   }
   else
   {
   for (i=1;i<=n;i++)
   {
   fact=fact*i;
   }
   printf("The factorial is %ld", fact);
   }
   return 0;
}
```

OUTPUT

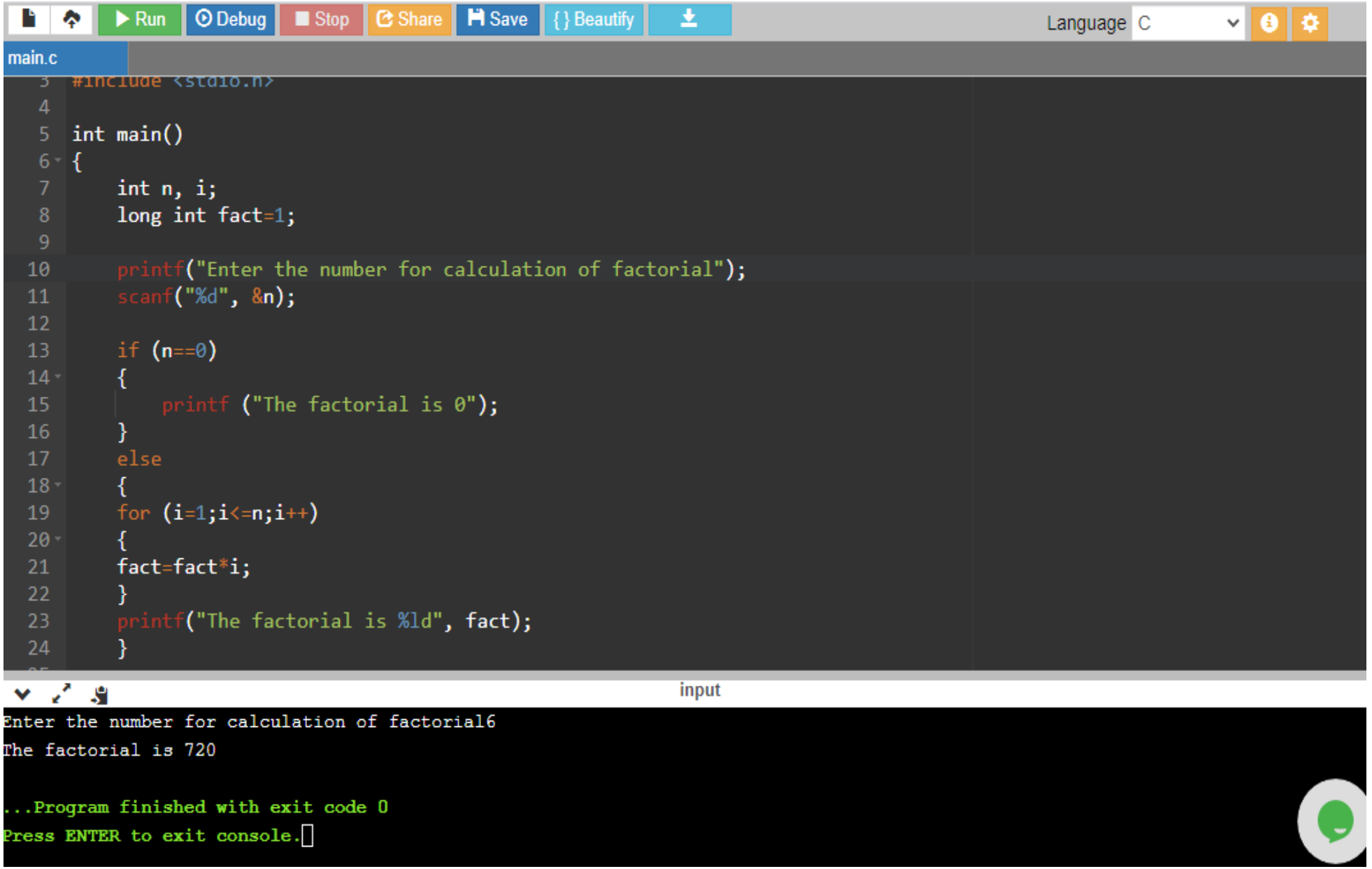
Enter the number for calculation of factorial 6

6

The factorial is 720

…Program finished with exit code 0

Press ENTER to exit console.


Run
Debug
Stop
Share
Save
{} Beautify
Language C
main.c
#include <stdio.h>
int main()
{
int n, i;
long int fact=1;
printf("Enter the number for calculation of factorial");
scanf("%d", &n);
if (n==0)
{
printf ("The factorial is 0");
}
else
{
for (i=1;i<=n;i++)
{
fact=fact*i;
}
printf("The factorial is %ld", fact);
}
input
Enter the number for calculation of factorial6
The factorial is 720
...Program finished with exit code 0
Press ENTER to exit console.

PROGRAM-19

OBJECTIVE: PROGRAM TO CALCULATE SUM OF FIBONAACI SERIES UPTO n TERMS.

LANGUAGE USED: C

THEORY: Fibonacci series is given by

$$a_r = a_{r-1} + a_{r-2}$$

A loop is then established such that it generates the next numbers in the sequence and also successively adds them up to calculate the sum of the sequence. Finally, the sum is displayed.

INPUT

```
/*CSE
Program to find the sum of Fibonacci series upto n terms.
07-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int n1=0,n2=1,n3,sum=1,terms;
   printf("Enter number of terms");
   scanf("%d",&terms);
      printf("The term is 0\n");
      printf("The term is 1\n");
   for(int i=2;i<terms;i++)
   {
      n3=n1+n2;
      printf("The term is %d\n", n3);
      n1=n2;
      n2=n3;
      sum=sum+n3;
   }
   printf("Sum of the series is %d",sum);
   return 0;
}
```

OUTPUT

Enter number of terms 5

The term is 0

The term is 1

The term is 1

The term is 2

The term is 3

Sum of the series is 7

…Program finished with exit code 0

Press ENTER to exit console.

main.c

```c
int main()
{
    int n1=0,n2=1,n3,sum=1,terms;

    printf("Enter number of terms");
    scanf("%d",&terms);

        printf("The term is 0\n");
        printf("The term is 1\n");


    for(int i=2;i<terms;i++)
    {
        n3=n1+n2;
        printf("The term is %d\n", n3);
        n1=n2;
        n2=n3;
        sum=sum+n3;
    }

    printf("Sum of the series is %d",sum);
    return 0;
```

input

```
The term is 0
The term is 1
The term is 1
The term is 2
The term is 3
Sum of the series is 7
```

PROGRAM-20

OBJECTIVE: PROGRAM TO FIND THE SUM OF THE DIGITS OF THE GIVEN INTEGER.

LANGUAGE USED: C

THEORY: A number is taken as input. for loop is then used such that it receives the digits from the number and successively adds them up to form a sum of the digits. Finally, the sum is displayed.

INPUT

```
/*CSE
Program to find the sum of the digits of the given integer.
07-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int n, a, b, sum=0;
   printf("Enter the integer");
   scanf("%d", &n);
   b=n;
   while (b>0)
   {
      a=b%10;
      sum=sum+a ;
      b=b/10;
   }
      printf("The sum of digits is %d", sum);
   return 0;
}
```

OUTPUT

```
Enter the integer 1234
The sum of digits is 10
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c

#include <stdio.h>

int main()
{
    int n, a, b, sum=0;
    printf("Enter the integer");
    scanf("%d", &n);

    b=n;
    while (b>0)
    {
        a=b%10;
        sum=sum+a ;
        b=b/10;
    }
        printf("The sum of digits is %d", sum);
    return 0;
}

```

input

```
Enter the integer 1234
The sum of digits is 10

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

PROGRAM-21

OBJECTIVE: PROGRAM TO FIND THE REVERSE OF THE GIVEN NUMBER AND CHECK FOR PALINDROME.

LANGUAGE USED: C

THEORY: A number is taken as input. for loop is then used such that it receives the digits from the number and successively adds them up in reverse order to obtain the reverse. Finally, the reverse is displayed. If and else statements are used to check whether the number is palindrome or not.

INPUT

```
/*CSE
Program to find the reverse of the given number and check for palindrome.
07-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int n, b, rev, rem;
   printf("Enter an integer ");
   scanf("%d", &b);
   rev=0;
   n=b;
   while (n != 0)
     {
      rem = n % 10;
      rev = rev * 10 + rem;
      n /= 10;
   }
   printf("Reversed number = %d\n", rev);
   if(b==rev)
   {
      printf("The number is a palindrome.");
   }
   else
   {
      printf("The number is not a palindrome.");
   }
```

```
    return 0;
}
```

OUTPUT

```
Enter an integer 121
Reversed number = 121
The number is a palindrome.
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
#include <stdio.h>
int main()
{
    int n, b, rev, rem;
    printf("Enter an integer ");
    scanf("%d", &b);
    rev=0;
    n=b;
    while (n != 0)
       {
        rem = n % 10;
        rev = rev * 10 + rem;
        n /= 10;
    }
    printf("Reversed number = %d\n", rev);
    if(b==rev)
    {
        printf("The number is a palindrome.");
    }
    else
    {
        printf("The number is not a palindrome.");
```

input

```
Enter an integer 121
Reversed number = 121
The number is a palindrome.

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

PROGRAM-22

OBJECTIVE: PROGRAM TO CHECK WHETHER THE GIVEN NUMBER IS AN ARMSTRONG NUMBER OR NOT.

LANGUAGE USED: C

THEORY: A number is taken as input. for loop is then used such that it receives the digits from the number. The digits are cubed and then added. If The input is equal to the result of for loop then the given number is Armstrong number. In all other cases, appropriate message is displayed.

INPUT

```
/*CSE
Program to check whether the given number is an Armstrong number or not.
14-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
   {
   int num, a, b, sum = 0;
   printf("Enter an integer: ");
   scanf("%d", &num);
   a = num;
   while (a>0)
   {    b = a % 10;
     sum=sum+ b*b*b;
     a /= 10;   }
   if (sum == num)
      printf("%d is an Armstrong number.", num);
   else
      printf("%d is not an Armstrong number.", num);
   return 0;
}
```

OUTPUT

```
Enter an integer: 153
153 is an Armstrong number.
…Program finished with exit code 0
Press ENTER to exit console.
```

```c
{

    int num, a, b, sum = 0;
    printf("Enter an integer: ");
    scanf("%d", &num);

    a = num;

    while (a>0)
    {
       b = a % 10;

       sum=sum+ b*b*b;

       a /= 10;
    }

    if (sum == num)
        printf("%d is an Armstrong number.", num);
    else
        printf("%d is not an Armstrong number.", num);

    return 0;
```

input

```
Enter an integer: 153
153 is an Armstrong number.

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

PROGRAM-23

OBJECTIVE: PROGRAM TO CHECK WHETHER THE GIVEN NUMBER IS A PERFECT NUMBER OR NOT.

LANGUAGE USED: C

THEORY: A number is taken as input. for loop is then used such that it receives the digits from the number. The divisors are added. If the input is equal to the result of for loop then the given number is Perfect number. In all other cases, appropriate message is displayed.

INPUT

```
/*CSE
Program to check whether the given number is a perfect number or not.
14-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int num, i, rem, sum=0;
   printf("Enter the integer");
   scanf("%d",&num);

   for(i=1;i<=num-1;i++)
   {
     rem=num % i;
     if(rem==0)
        sum+=i;
   }
   if(sum==num)
   {
      printf("The number is a perfect number.");
   }
   else
   {
      printf("The number is not a perfect number.");
   }
   return 0;
```

}

OUTPUT

Enter the integer 6

The number is a perfect number.

…Program finished with exit code 0

Press ENTER to exit console.

main.c

```c
{
    int num, i, rem, sum=0;
    printf("Enter the integer");
    scanf("%d",&num);

    for(i=1;i<=num-1;i++)
    {
       rem=num % i;
       if(rem==0)
          sum+=i;
    }

    if(sum==num)
    {
        printf("The number is a perfect number.");
    }
    else
    {
        printf("The number is not a perfect number.");
    }
    return 0;
}
```

input

```
Enter the integer 6
The number is a perfect number.

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

PROGRAM-24

OBJECTIVE: PROGRAM TO CALCULATE THE SUM OF THE GIVEN SERIES 2+4+6+8+…. UPTO n TERMS

LANGUAGE USED: C

THEORY: Number of terms is taken from the user as input. The given series is given by the formula:

$$a_n = 2n$$

for loop is then established such that it generates the next numbers in the series up to n and also successively adds them up to form a sum of the sequence. Finally, sum is displayed.

INPUT

```
/*CSE
Program to find the sum of the series 2+4+6+8+….upto n terms
07-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int i, n, sum=0;
   printf("Enter the number of terms");
   scanf("%d", &n);
   for(i=1;i<=n;i++)
   {
      sum=sum+2*i;
    }
      printf("\nSum of the series is %d", sum);
   return 0;
}
```

OUTPUT

```
Enter the number of terms 5
Sum of the series is 30
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
#include <stdio.h>

int main()
{
    int i, n, sum=0;
    printf("Enter the number of terms");
    scanf("%d", &n);

    for(i=1;i<=n;i++)
    {
        sum=sum+2*i;
    }
        printf("\nSum of the series is %d", sum);

    return 0;
}
```

input

```
Enter the number of terms5

Sum of the series is 30

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

PROGRAM-25

OBJECTIVE: PROGRAM TO CHECK WHETHER THE GIVEN NUMBER IS A PRIME NUMBER OR NOT.

LANGUAGE USED: C

THEORY: **Number is taken as input from the user. for loop is then used such that it checks the remainder. The following condition is checked:**

$$\boldsymbol{num \,\%\, i = 0}$$

If number of times remainder is 2, then the number is prime else it is a composite number.

INPUT

```
/*CSE
Program to check whether the given number is a prime number or not.
07-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
  int n, i, c = 0;
      printf("Enter any number");
      scanf("%d", &n);

   for (i = 1; i <= n; i++)
   {
      if (n % i == 0)
      {
       c++;
      }
   }
   if (c == 2)
      {
       printf("n is a Prime number");
      }
   else
      {
```

```
        printf("n is not a Prime number");
       }
  return 0;
}
```

OUTPUT

```
Enter any number101
n is a Prime number
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
int n, i, c = 0;

    printf("Enter any number");
    scanf("%d", &n);

 for (i = 1; i <= n; i++)
 {
    if (n % i == 0)
    {
     c++;
    }
 }

 if (c == 2)
    {
     printf("n is a Prime number");
    }
 else
    {
     printf("n is not a Prime number");
    }
return 0;
```

input

```
Enter any number101
n is a Prime number

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

PROGRAM-26

OBJECTIVE: PROGRAM TO FIND THE SUM OF THE FOLLOWING SERIES:

1-1/2+1/3-1/4+1/5+…UPTO n TERMS.

LANGUAGE USED: C

THEORY: **Number of terms is taken from the user as input. The given series is given by:**

$$a_r = (-1)^{r+1}\frac{1}{r}$$

for loop is then used such that it generates the next numbers in the series up to n terms and successively adds them up to calculate sum of the sequence. Finally, sum is displayed.

INPUT

```
/*CSE

Program to find the sum of following series:

1 –1/2 + 1/3 –1/4 + 1/5 -..... up to n terms

05-11-2020

By DRISHTI ARORA*/


#include <stdio.h>

#include <math.h>


int main()

{

   int n,i;

   float sum=0;

   printf("Enter number of terms");

   scanf("%d", &n);


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

   {

      sum =sum+ (pow(-1,i+1))/i;

   }

      printf("%f", sum);
```

```
    return 0;
}
```

OUTPUT

```
Enter number of terms 3
0.833333
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c

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

int main()
{
    int n,i;
    float sum=0;
    printf("Enter number of terms");
    scanf("%d", &n);

    for(i=1;i<=n;i++)
    {
        sum =sum+ (pow(-1,i+1))/i;
    }
        printf("%f", sum);

    return 0;
}

```

input

```
Enter number of terms 3
0.833333

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

PROGRAM-27

OBJECTIVE: PROGRAM TO CALCULATE THE SUM OF THE GIVEN SERIES 1!+2!+3!+… UPTO n TERMS

LANGUAGE USED: C

THEORY: Number of terms is taken from the user as input. The given series is given by:

$$a_r = r!$$

for loop is used such that it generates the next numbers in the series up to n terms and successively adds them up to form a sum of the sequence Finally, the sum is displayed.

INPUT

```
/*CSE
Program to find the sum of the given series 1!+2!+3!+…… upto n terms
07-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int i,n,fact=1,sum=0;
   printf("Enter the number of terms\n");
   scanf("%d", &n);
   for(i=1;i<=n;i++)
   {
      fact =fact*i;
      sum =sum+fact;
   }
   printf("Sum of the given series upto %d terms is %d" ,n,sum);
   return 0; }
```

OUTPUT

```
Enter the number of terms
4
Sum of the given series upto 4 terms is 33
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c

//By Drishti Arora


#include <stdio.h>

int main()
{
    int i,n,fact=1,sum=0;

    printf("Enter the number of terms\n");
    scanf("%d", &n);

    for(i=1;i<=n;i++)
    {
        fact =fact*i;
        sum =sum+fact;
    }
    printf("Sum of the given series upto %d terms is %d" ,n,sum);

    return 0;
}
```

input

```
Enter the number of terms
4
Sum of the given series upto 4 terms is 33

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

PROGRAM-28

OBJECTIVE: PROGRAM TO CALCULATE THE SUM OF THE GIVEN SERIES

-1^3+3^3-5^3+7^3-… UPTO n TERMS

LANGUAGE USED: C

THEORY: : Number of terms is taken from the user as input. The given series is given by:

$$a_r = (-1)^r(2r-1)^3$$

for loop is used such that it generates the next numbers in the series up to n terms and successively adds them up to form a sum of the sequence Finally, the sum is displayed.

INPUT

```
/*CSE
Program to find the sum of the given series -1^3+3^3-5^3+7^3-…… upto n terms
07-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
#include <math.h>
int main()
{
  int terms, i, a=1, sum=0;
  printf("Enter number of terms");
  scanf("%d", &terms);
  for(i=1;i<=terms;i++)
  {
      sum=sum+pow(a,3)*pow(-1,i);
      a=a+2;
  }
     printf("Sum of the series is %d",sum);
   return 0;
}
```

OUTPUT

Enter the number of terms

2

Sum of the series is 26

…Program finished with exit code 0

Press ENTER to exit console.

main.c

```c

#include <stdio.h>
#include <math.h>
int main()
{
   int terms, i, a=1, sum=0;
   printf("Enter number of terms");
   scanf("%d", &terms);

   for(i=1;i<=terms;i++)
   {
        sum=sum+pow(a,3)*pow(-1,i);
        a=a+2;
   }
       printf("Sum of the series is %d",sum);
    return 0;
}

```

input

```
Enter number of terms
2
Sum of the series is 26


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

PROGRAM-29

OBJECTIVE: Program to find the sum of following series:

S = 1/1! + 2/2! + 3/3! + ... 7 terms.

LANGUAGE USED: C

THEORY: Number of terms is taken from the user as input. The given series is given by:

$$a_r = \frac{r}{r!}$$

for loop is used such that it generates the next numbers in the series up to n terms and successively adds them up to form a sum of the sequence Finally, the sum is displayed.

INPUT

```
/*CSE
Program to find the sum of following series:
S = 1/1! + 2/2! + 3/3! + ... 7 terms.
07-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int i;
   float fact=1,sum=0;
   for (i=1;i<=7;i++)
   {
      fact=fact*i;
      sum=sum+(i/fact);
   }
   printf("The sum is %f", sum);
   return 0;
}
```

OUTPUT

```
The sum is 2.718056
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
#include <stdio.h>

int main()
{
    int i;
    float fact=1,sum=0;

    for (i=1;i<=7;i++)
    {
        fact=fact*i;
        sum=sum+(i/fact);
    }

    printf("The sum is %f", sum);

    return 0;
}
```

input

```
The sum is 2.718056

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

PROGRAM-30

OBJECTIVE: Program to convert binary number to decimal number.

LANGUAGE USED: C

THEORY: Binary number is taken as input. Decimal number can be calculated by:

$$dec = \sum 2^r a_r = 2^n a_n + 2^{n-1}\, a_{n-1} + 2^{n-2} a_{n-2} + \cdots + 2^0 a_0$$

Decimal equivalent is displayed.

INPUT

```
/*CSE
Program to convert binary number to decimal number.
07-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int i, rem, base=1,dec=0;
   long int num;
   printf("Enter the binary number\n");
   scanf("%ld",&num);
    while (num>0)
   {
      rem = num % 10;
      dec = dec+(rem * base);
      num = num / 10 ;
      base = base * 2;
   }
   printf("The decimal number is %d",dec);
   return 0;
}
```

OUTPUT

```
Enter the binary number
1010
The decimal number is 10
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
#include <stdio.h>

int main()
{
    int i, rem, base=1,dec=0;
    long int num;

    printf("Enter the binary number\n");
    scanf("%ld",&num);

    while (num>0)
    {
        rem = num % 10;
        dec = dec+(rem * base);
        num = num / 10 ;
        base = base * 2;
    }

    printf("The decimal number is %d",dec);

    return 0;
}
```

input

```
Enter the binary number
1010
The decimal number is 10

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

PROGRAM-31

OBJECTIVE: PROGRAM TO CALCULATE THE SUM OF THE GIVEN SERIES 1^4+3^4+5^4+… UPTO n TERMS

LANGUAGE USED: C

THEORY: The number of whose factorial is to be calculated is taken as input from the user.

$$a_r = (2r-1)^4$$

for loop is used to calculate factorial and the result is displayed.

INPUT

```
/*CSE
Program to find the sum of the given series 1^4+3^4+5^4+…… upto n terms
07-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
#include <math.h>
int main()
{
  int terms, i, a=1, sum=0;
  printf("Enter number of terms");
  scanf("%d", &terms);

  for(i=1;i<=terms;i++)
  {
      sum=sum+pow(a,4);
      a=a+2;
  }
     printf("Sum of the series is %d",sum);
   return 0;
}
```

OUTPUT

```
Enter number of terms 2
Sum of the series is 82
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

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

int main()

{

   int terms, i, a=1, sum=0;

   printf("Enter nu
   scanf("%d", &terms);

   for(i=1;i<=terms;i++)
   {
        sum=sum+pow(a,4);
        a=a+2;
   }

      printf("Sum of the series is %d",sum);

    return 0;
}
```

char16_t keyword

input

```
Enter number of terms 2
Sum of the series is 82

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

PROGRAM-32

OBJECTIVE: PROGRAM TO PRINT THE FOLLOWING PATTERN:

* * *

* * *

* * *

LANGUAGE USED: C

THEORY: To print the pattern for three rows and three columns, a nested loop system is used such that it prints 3 asterisks (∗) per row for 3 rows, which are displayed.

INPUT

```
/*CSE
Program to print the following pattern:
*  *  *
*  *  *
*  *  *
28-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int i,j;
   for(i=1;i<=3;i++)
   {
      for(j=1;j<=3;j++)
      {
         printf("* ");
      }
      printf("\n");
   }
   return 0;
}
```

OUTPUT

```
*       *       *

*       *       *

*       *       *

…Program finished with exit code 0

Press ENTER to exit console.
```

main.c

```c
#include <stdio.h>

int main()

{
    int i,j;

    for(i=1;i<=3;i++)
    {

        for(j=1;j<=3;j++)
        {
            printf("*\t");
        }
        printf("\n");
    }
    return 0;
}

```

input

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


...Program finished with exit code 0
```

PROGRAM-33

OBJECTIVE: PROGRAM TO PRINT THE FOLLOWING PATTERN:

1 2 3

1 2 3

1 2 3

LANGUAGE USED: C

THEORY: To print the given pattern for three rows and three columns, a nested loop system is used such that it prints the required pattern, which are displayed.

INPUT

```
/*Program to print the following pattern:
1       2       3
1       2       3
1       2       3
28-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int i,j;
   for(i=1;i<=3;i++)
   {
      for(j=1;j<=3;j++)
      {
         printf("%d\t",j);
      }
      printf("\n");
   }
   return 0;
}
```

OUTPUT

1 2 3

1 2 3

1 2 3

…Program finished with exit code 0

Press ENTER to exit console.

main.c

```
1   2   3
1   2   3
28-Oct-2020
By DRISHTI ARORA*/

#include <stdio.h>

int main()
{
    int i,j;
    for(i=1;i<=3;i++)
    {
        for(j=1;j<=3;j++)
        {
            printf("%d\t",j);
        }
        printf("\n");
    }

    return 0;
}
```

input

```
1       2       3
1       2       3
1       2       3


...Program finished with exit code 0
```

PROGRAM-34

OBJECTIVE: PROGRAM TO PRINT THE FOLLOWING PATTERN:

1 1 1

2 2 2

3 3 3

LANGUAGE USED: C

THEORY: To print the given pattern for three rows and three columns, a nested loop system is used such that it prints the required pattern, which are displayed.

INPUT

```
/*CSE
Program to print the following pattern:
1 1 1
2 2 2
3 3 3
28-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int i,j;
   for(i=1;i<=3;i++)
   {
      for(j=1;j<=3;j++)
      {
         printf("%d ",i);
      }
      printf("\n");
   }
   return 0;
}
```

OUTPUT

1 1 1

2 2 2

3 3 3

…Program finished with exit code 0

Press ENTER to exit console.

main.c

```c
/*Program to print the following pattern:
1   1   1
2   2   2
3   3   3
28-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
    int i,j;
    for(i=1;i<=3;i++)
    {
        for(j=1;j<=3;j++)
        {
            printf("%d\t",i);
        }
        printf("\n");
    }
    return 0;
}

```

input

```
1       1       1
2       2       2
3       3       3


...Program finished with exit code 0
```

PROGRAM-35

OBJECTIVE: PROGRAM TO PRINT THE FOLLOWING PATTERN:

3 2 1

3 2 1

3 2 1

LANGUAGE USED: C

THEORY: To print the given pattern for three rows and three columns, a nested loop system is used such that it prints the required pattern, which are displayed.

INPUT

```
/*CSE
Program to print the following pattern:
3	2	1
3	2	1
3	2	1
28-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int i,j;
   for(i=3;i>=1;i--)
   {
      for(j=3;j>=1;j--)
      {
         printf("%d\t",j);
      }
      printf("\n");
   }
   return 0;
}
```

OUTPUT

3 2 1

3 2 1

3 2 1

…Program finished with exit code 0

Press ENTER to exit console.

main.c

```c
/*Program to print the following pattern:
3   2   1
3   2   1
3   2   1
28-Oct-2020
By DRISHTI ARORA*/

#include <stdio.h>

int main()
{
    int i,j;
    for(i=3;i>=1;i--)
    {
        for(j=3;j>=1;j--)
        {
            printf("%d\t",j);
        }
        printf("\n");
    }

    return 0;
```

input

```
3       2       1
3       2       1
3       2       1


...Program finished with exit code 0
```

PROGRAM-36

OBJECTIVE: PROGRAM TO PRINT THE FOLLOWING PATTERN:

3 3 3

2 2 2

1 1 1

LANGUAGE USED: C

THEORY: To print the given pattern for three rows and three columns, a nested loop system is used such that it prints the required pattern, which are displayed.

INPUT

```
/*CSE

Program to print the following pattern:

3       3       3

2       2       2

1       1       1

28-Oct-2020

By DRISHTI ARORA*/


#include <stdio.h>


int main()

{

   int i,j;

   for(i=3;i>=1;i--)

   {

      for(j=3;j>=1;j--)

      {

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

      }

      printf("\n");

   }


   return 0;

}
```

OUTPUT

3 3 3

2 2 2

1 1 1

…Program finished with exit code 0

Press ENTER to exit console.

main.c

```c
/*Program to print the following pattern:
3   3   3
2   2   2
1   1   1
28-Oct-2020
By DRISHTI ARORA*/

#include <stdio.h>

int main()
{
    int i,j;
    for(i=3;i>=1;i--)
    {
        for(j=3;j>=1;j--)
        {
            printf("%d\t",i);
        }
        printf("\n");
    }

    return 0;
```

input

```
3       3       3
2       2       2
1       1       1


...Program finished with exit code 0
```

PROGRAM-37

OBJECTIVE: PROGRAM TO PRINT THE FOLLOWING PATTERN:

*

* *

* * *

LANGUAGE USED: C

THEORY: To print the given pattern for three rows and three columns, a nested loop system is used such that it prints the required pattern, which are displayed.

INPUT

```
/*CSE
Program to print the following pattern:
*
*  *
*  *  *
28-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int i,j;
   for(i=1;i<=3;i++)
   {
      for(j=1;j<=i;j++)
      {
         printf("*\t");
      }
      printf("\n");
   }
   return 0;
}
```

OUTPUT

*

* *

* * *

…Program finished with exit code 0

Press ENTER to exit console.

main.c

```c
/*CSE
Program to print the following pattern:
*
*   *
*   *   *
28-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
    int i,j;
    for(i=1;i<=3;i++)
    {
        for(j=1;j<=i;j++)
        {
            printf("*\t");
        }
        printf("\n");
    }
    return 0;
}

```

input

```
*
*       *
*       *       *


...Program finished with exit code 0
```

PROGRAM-38

OBJECTIVE: PROGRAM TO PRINT THE FOLLOWING PATTERN:

1

1 2

1 2 3

LANGUAGE USED: C

THEORY: To print the given pattern for three rows and three columns, a nested loop system is used such that it prints the required pattern, which are displayed.

INPUT

```
/*CSE
Program to print the following pattern:
1
1 2
1 2 3
28-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int i,j;
   for(i=1;i<=3;i++)
   {
      for(j=1;j<=i;j++)
      {
         printf("%d\t",j);
      }
      printf("\n");
   }
   return 0;
}
```

OUTPUT

1

1 2

1 2 3

…Program finished with exit code 0

Press ENTER to exit console.

main.c

```c
/*1 2 3
28-Oct-2020
By DRISHTI ARORA*/

#include <stdio.h>

int main()
{
    int i,j;
    for(i=1;i<=3;i++)
    {
        for(j=1;j<=i;j++)
        {
            printf("%d\t",j);
        }
        printf("\n");
    }

    return 0;
}

```

input

```
1
1       2
1       2       3


...Program finished with exit code 0
```

PROGRAM-39

OBJECTIVE: PROGRAM TO PRINT THE FOLLOWING PATTERN:

1

2 2

3 3 3

LANGUAGE USED: C

THEORY: To print the given pattern for three rows and three columns, a nested loop system is used such that it prints the required pattern, which are displayed.

INPUT

```
/*CSE
Program to print the following pattern:
1
2 2
3 3 3
28-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int i,j;
   for(i=1;i<=3;i++)
   {
      for(j=1;j<=i;j++)
      {
         printf("%d\t",i);
      }
      printf("\n");
   }
   return 0;
}
```

OUTPUT

1

2 2

3 3 3

…Program finished with exit code 0

Press ENTER to exit console.

main.c

```
3   3   3
28-Oct-2020
By DRISHTI ARORA*/

#include <stdio.h>

int main()
{
    int i,j;
    for(i=1;i<=3;i++)
    {
        for(j=1;j<=i;j++)
        {
            printf("%d\t",i);
        }
        printf("\n");
    }

    return 0;
}

```

input

```
1
2       2
3       3       3


...Program finished with exit code 0
```

PROGRAM-40

OBJECTIVE: PROGRAM TO PRINT THE FOLLOWING PATTERN:

3

3 2

3 2 1

LANGUAGE USED: C

THEORY: To print the given pattern for three rows and three columns, a nested loop system is used such that it prints the required pattern, which are displayed.

INPUT

```
/*CSE
Program to print the following pattern:
3
3 2
3 2 1
28-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int i,j;
   for(i=3;i>=1;i--)
   {
      for(j=3;j>=i;j--)
      {
         printf("%d\t",j);
      }
      printf("\n");
   }
   return 0;
}
```

OUTPUT

```
3

3       2

3       2       1

…Program finished with exit code 0

Press ENTER to exit console.
```

main.c

```c
/*CSE
Program to print the following pattern:
3
3   2
3   2   1
28-Oct-2020
By DRISHTI ARORA*/

#include <stdio.h>

int main()
{
    int i,j;
    for(i=3;i>=1;i--)
    {
        for(j=3;j>=i;j--)
        {
            printf("%d\t",j);
        }
        printf("\n");
    }

```

input

```
3
3       2
3       2       1


...Program finished with exit code 0
```

PROGRAM-41

OBJECTIVE: PROGRAM TO PRINT THE FOLLOWING PATTERN:

3

2 2

1 1 1

LANGUAGE USED: C

THEORY: To print the given pattern for three rows and three columns, a nested loop system is used such that it prints the required pattern, which are displayed.

INPUT

```
/*CSE
Program to print the following pattern:
3
2 2
1 1 1
28-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>

int main()
{
   int i,j;
   for(i=3;i>=1;i--)
   {
      for(j=3;j>=i;j--)
      {
         printf("%d\t",i);
      }
      printf("\n");
   }

   return 0;
}
```

OUTPUT

3

2 2

1 1 1

…Program finished with exit code 0

Press ENTER to exit console.

main.c

```
2   2
1   1   1
28-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>

int main()
{
    int i,j;
    for(i=3;i>=1;i--)
    {
        for(j=3;j>=i;j--)
        {
            printf("%d\t",i);
        }
        printf("\n");
    }

    return 0;
}

```

input

```
3
2       2
1       1       1


...Program finished with exit code 0
```

PROGRAM-42

OBJECTIVE: PROGRAM TO PRINT THE GIVEN PATTERN.

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

LANGUAGE USED: C

THEORY: To print the given pattern for three rows and three columns, a nested loop system is used such that it prints the required pattern, which are displayed.

INPUT

```
/*CSE

Program to print the given pattern.
```

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

```
28-Oct-2020

By DRISHTI ARORA*/

#include <stdio.h>


int main()

{

   int i, j, r;

   printf("Enter the number of rows");

   scanf("%d", &r);

   for(i=1;i<=r;i++)

   {

     for(j=0;j<=r-i;j++)

     {

         printf("\t");

     }
```

```
      for(j=1;j<=(2*i)-1;j++)
      {
         printf("*\t");
      }
      printf("\n");
   }
   return 0;
}
```

OUTPUT

```
Enter the number of rows 4
                        *
                *       *       *
        *       *       *       *       *
*       *       *       *       *       *       *
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
#include <stdio.h>

int main()
{
    int i, j, r;

    printf("Enter the number of rows");
    scanf("%d", &r);

    for(i=1;i<=r;i++)
    {
       for(j=0;j<=r-i;j++)
       {
           printf("\t");
       }
       for(j=1;j<=(2*i)-1;j++)
       {
          printf("*\t");
       }
       printf("\n");
    }
    return 0;
}
```

input

```
nter the number of rows 4
                        *
                    *       *       *
                *       *       *       *       *
            *       *       *       *       *       *       *
```

PROGRAM-43

OBJECTIVE: PROGRAM TO PRINT THE GIVEN PATTERN.

```
                1
            1   2   1
        1   2   3   2   1
    1   2   3   4   3   2   1
1   2   3   4   5   4   3   2   1
```

LANGUAGE USED: C

THEORY: To print the given pattern for three rows and three columns, a nested loop system is used such that it prints the required pattern, which are displayed.

INPUT

```
/*CSE

Program to print the given pattern.

                1
            1   2   1
        1   2   3   2   1
    1   2   3   4   3   2   1
1   2   3   4   5   4   3   2   1


28-Oct-2020

By DRISHTI ARORA*/

#include<stdio.h>


int main()

{

   int i, j, n;


   printf("Enter the number of rows");

   scanf("%d", &n);

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

   {

      for(j=n-1;j>i;j--)
```

```
        {
            printf("\t");
        }
        for(j=0;j<i+1;j++)
        {
            printf("%d\t",j+1);
        }
        j--;
        for(;j>=1;j--)
        {
            printf("%d\t", j);
        }
        printf("\n");
    }
    return 0;
}
```

OUTPUT

```
Enter the number of rows 5
                        1
                    1   2   1
                1   2   3   2   1
            1   2   3   4   3   2   1
1       2   3   4   5   4   3   2   1
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```
6
7       printf("Enter the number of rows");
8       scanf("%d", &n);
9
10      for(i=0;i<n;i++)
11      {
12          for(j=n-1;j>i;j--)
13          {
14              printf("\t");
15          }
16          for(j=0;j<i+1;j++)
17          {
18              printf("%d\t",j+1);
19          }
20          j--;
21          for(;j>=1;j--)
22          {
23              printf("%d\t", j);
24          }
25          printf("\n");
26      }
27  }
```

input

```
Enter the number of rows 5
                        1
                    1   2   1
                1   2   3   2   1
            1   2   3   4   3   2   1
        1   2   3   4   5   4   3   2   1
```

PROGRAM-44

OBJECTIVE: PROGRAM TO PRINT THE GIVEN PATTERN.

```
                5
            5   4   5
        5   4   3   4   5
    5   4   3   2   3   4   5
5   4   3   2   1   2   3   4   5
```

LANGUAGE USED: C

THEORY: To print the given pattern for three rows and three columns, a nested loop system is used such that it prints the required pattern, which are displayed.

INPUT

```
/*CSE
Program to print the given pattern.
                5
            5   4   5
        5   4   3   4   5
    5   4   3   2   3   4   5
5   4   3   2   1   2   3   4   5
28-Oct-2020
By DRISHTI ARORA*/
#include<stdio.h>
int main()
{
   int i, j, k, l, n;

   printf("Enter the number of rows");
   scanf("%d", &n);

   for(i=n;i>=1;i--)
   {
      for(j=1;j<i;j++)
      {
         printf("\t");
```

```
        }
        for(k=n;k>=i;k--)
        {
           printf("%d\t",k);
        }
        if(i==n)
        {

        }
           else
           {
              k=k+2;
              for(l=k;l<=n;l++)
              {
                 printf("%d\t",l);
              }
           }
        printf("\n");
     }
}
```

OUTPUT

```
Enter the number of rows 5
                        5
                    5   4   5
                5   4   3   4   5
            5   4   3   2   3   4   5
5       4   3   2   1   2   3   4   5
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```
10      for(i=n;i>=1;i--)
11      {
12          for(j=1;j<i;j++)
13          {
14              printf("\t");
15          }
16          for(k=n;k>=i;k--)
17          {
18              printf("%d\t",k);
19          }
20          if(i==n)
21          {
22
23          }
24              else
25              {
26                  k=k+2;
27                  for(l=k;l<=n;l++)
28                  {
29                      printf("%d\t",l);
30                  }
31              }
```

input

```
                        5
                    5   4   5
                5   4   3   4   5
            5   4   3   2   3   4   5
5       4       3       2       1       2       3       4       5
```

PROGRAM-45

OBJECTIVE: PROGRAM TO PRINT THE GIVEN PATTERN.

1

0 1

1 0 1

0 1 0 1

LANGUAGE USED: C

THEORY: To print the given pattern for three rows and three columns, a nested loop system is used such that it prints the required pattern, which are displayed.

INPUT

```
/*CSE
Program to print the given pattern.
1
0 1
1 0 1
0 1 0 1
28-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int n, i, j;
   printf("Enter the number of rows");
   scanf("%d", &n);
   for(i=1;i<=n;i++)
   {
      for(j=1;j<=i;j++)
      {
         if((i+j)%2==0)
         printf("1\t");
         else
         printf("0\t");
      }
```

```
        printf("\n");
    }
    return 0;
}
```

OUTPUT

```
Enter the number of rows 4
1
0       1
1       0       1
0       1       0       1
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
int main()
{
    int n, i, j;

    printf("Enter the number of rows");
    scanf("%d", &n);

    for(i=1;i<=n;i++)
    {
        for(j=1;j<=i;j++)
        {
            if((i+j)%2==0)
            printf("1\t");
            else
            printf("0\t");
        }
        printf("\n");
    }

    return 0;
}
```

input

```
Enter the number of rows 4
1
0       1
1       0       1
0       1       0       1
```

PROGRAM-46

OBJECTIVE: PROGRAM TO PRINT ALL PRIME NUMBERS <=A GIVEN NUMBER.

LANGUAGE USED: C

THEORY: Number is taken as input from the user. for loop is then used such that it checks the remainder. The following condition is checked:

$$num \% i = 0$$

The numbers are checked for number of remainders and all prime number within the range are displayed.

INPUT

```
/*CSE
Progarm to print all prime numbers <= a given number.
28-Oct-2020
By DRISHTI ARORA*/
#include<stdio.h>
int main()
{   int n,i,fact,j;
   printf("Enter the Number:");
   scanf("%d",&n);
   printf("Prime Numbers are: \n");
   for(i=1; i<=n; i++)
   {
      fact=0;
      for(j=1; j<=n; j++)
         {
         if(i%j==0)
         fact++;
         }
         if(fact==2)
   printf("%d " ,i);   }
return 0;}
```

OUTPUT

```
Enter the Number:10
Prime Numbers are:
2 3 5 7
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c

int main()
{
    int n,i,fact,j;

    printf("Enter the Number:");
    scanf("%d",&n);
    printf("Prime Numbers are: \n");

    for(i=1; i<=n; i++)
    {
        fact=0;
        for(j=1; j<=n; j++)
            {
            if(i%j==0)
            fact++;
            }
            if(fact==2)
    printf("%d " ,i);
    }
return 0;
}
```

input

```
Enter the Number:10
Prime Numbers are:
2 3 5 7

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

PROGRAM-47

OBJECTIVE: PROGRAM TO CONVERT DECIMAL NUMBER TO BINARY NUMBER.

LANGUAGE USED: C

THEORY: Decimal number is taken as input. Binary number can be calculated by:

$$bin = \sum 10^r a_r = 10^n a_n + 10^{n-1} a_{n-1} + 10^{n-2} a_{n-2} + \cdots + 10^0 a_0$$

Binary equivalent is displayed.

INPUT

```
/*CSE
Program to convert decimal number to binary number.
28-Oct-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
int i, rem, base=1, dec;
long int bin=0;
printf("Enter the decimal number\n");
scanf("%d",&dec);
 while (dec>0)
{
   rem=dec%2;
   dec = dec/2;
   bin = bin+rem*base;
   base=base*10;
}
printf("The binary number is %ld",bin);
return 0;
}
```

OUTPUT

Enter the decimal number

10

The binary number is 1010

…Program finished with exit code 0

Press ENTER to exit console.

main.c

```c
#include <stdio.h>

int main()
{
int i, rem, base=1, dec;
long int bin=0;

printf("Enter the decimal number\n");
scanf("%d",&dec);

 while (dec>0)
{
    rem=dec%2;
    dec = dec/2;
    bin = bin+rem*base;
    base=base*10;
}

printf("The binary number is %ld",bin);

return 0;
}
```

input

```
Enter the decimal number
10
The binary number is 1010

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

PROGRAM-48

OBJECTIVE: Program to find product, sum, average, max and min from a list of n numbers.

LANGUAGE USED: C

THEORY: Input of the numbers is taken from the user. For sum, product and average, mathematical formulas are used. For maximum and minimum values, first element is taken as maximum or minimum value and other elements are compare. Using if statement, maximum or minimum value is chosen. Finally the result is displayed.

INPUT

```
/*CSE
Program to find product, sum, average, max and min from a list of n numbers.
11-Nov-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int a[50], n, i, prod=1, sum=0, avg, max, min;
   printf("Enter number of elements (not more than 50)\n");
   scanf("%d", &n);
   for(i=0;i<n;i++)
   {
      printf("Enter %d element\n", i+1);
      scanf("%d", &a[i]);
   }
   //product of numbers
   for(i=0;i<n;i++)
   {
      prod= prod*a[i];
   }
   //sum of numbers
   for(i=0;i<n;i++)
   {
      sum= sum+a[i];
```

```
    }
    //average of numbers
    avg= (float)sum/n;
    //maximum among the numbers
    max=a[0];
    for(i=1;i<n;i++)
    {
       if(a[i]>max)
       {
          max=a[i];
       }
    }
    //minimum among the numbers
    min=a[0];
    for(i=1;i<n;i++)
    {
       if(a[i]<min)
       {
          min=a[i];
       }
    }
    printf("Product of %d numbers is %d\n", n, prod);
    printf("Sum of %d numbers is %d\n", n, sum);
    printf("Average of %d numbers is %d\n", n, avg);
    printf("Maximum of %d numbers is %d\n", n, max);
    printf("Minimum of %d numbers is %d\n", n, min);
    return 0;
}
```

OUTPUT

Enter number of elements (not more than 50)

5

Enter 1 element

1

Enter 2 element

2

Enter 3 element

3

Enter 4 element

4

Enter 5 element

5

Product of 5 numbers is 120

Sum of 5 numbers is 15

Average of 5 numbers is 3

Maximum of 5 numbers is 5

Minimum of 5 numbers is 1

…Program finished with exit code 0

Press ENTER to exit console.

main.c

```c
#include <stdio.h>

int main()
{
    int a[50], n, i, prod=1, sum=0, avg, max, min;

    printf("Enter number of elements (not more than 50)\n");
    scanf("%d", &n);

    for(i=0;i<n;i++)
    {
        printf("Enter %d element\n", i+1);
        scanf("%d", &a[i]);
    }

    //product of numbers
    for(i=0;i<n;i++)
    {
        prod= prod*a[i];
    }

    //sum of numbers
```

input

```
Enter number of elements (not more than 50)
5
Enter 1 element
1
Enter 2 element
2
```

main.c

```
21
22      //sum of numbers
23      for(i=0;i<n;i++)
24      {
25          sum= sum+a[i];
26      }
27
28      //average of numbers
29      avg= (float)sum/n;
30
31      //maximum among the numbers
32      max=a[0];
33      for(i=1;i<n;i++)
34      {
35          if(a[i]>max)
36          {
37              max=a[i];
38          }
39      }
40
41      //minimum among the numbers
42      min=a[0];
```

input

```
Enter 3 element
3
Enter 4 element
4
Enter 5 element
5
```

main.c

```c
        }
    }

    //minimum among the numbers
    min=a[0];
    for(i=1;i<n;i++)
    {
        if(a[i]<min)
        {
            min=a[i];
        }
    }

    printf("Product of %d numbers is %d\n", n, prod);
    printf("Sum of %d numbers is %d\n", n, sum);
    printf("Average of %d numbers is %d\n", n, avg);
    printf("Maximum of %d numbers is %d\n", n, max);
    printf("Minimum of %d numbers is %d\n", n, min);

    return 0;
}
```

input

```
Product of 5 numbers is 120
Sum of 5 numbers is 15
Average of 5 numbers is 3
Maximum of 5 numbers is 5
Minimum of 5 numbers is 1
```

PROGRAM-49

OBJECTIVE: Program to display the index of smallest and largest element in 10 integers.

LANGUAGE USED: C

THEORY: Input of the numbers is taken from the user. For maximum and minimum values, first element is taken as maximum or minimum value and other elements are compare. Using if statement, maximum or minimum value is chosen. Finally the the values along with their index is displayed.

INPUT

```
/*CSE
Program to display the index of smallest and largest element in 10 integers.
11-Nov-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int a[10], i, large, small, index1, index2;
   printf("Enter 10 integers");
   for(i=0;i<10;i++)
   {
   scanf("%d", &a[i]);
   }
   large=small=a[0];
   index1=index2=0;
   for(i=0;i<10;i++)
   {
      //largest integer
      if (a[i]>large)
      {
         large = a[i];
         index1=i;
      }
      //smallest integer
```

```
        if (a[i]<small)
        {
            small= a[i];
            index2=i;
        }
    }
    printf("Largest integer among  the given integers is %d with index: a[%d]\n", large , index1+1);
    printf("Smallest integer among  the given integers is %d with index: a[%d]\n", small , index2+1);
    return 0;
}
```

OUTPUT

```
Enter 10 integers 9 8 7 6 5 4 3 2 1 0
Largest integer among the given integers is 9 with index: a[1]
Smallest integer among the given integers is 0 with index: a[10]
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
    int a[10], i, large, small, index1, index2;
    printf("Enter 10 integers");
    for(i=0;i<10;i++)
    {
    scanf("%d", &a[i]);
    }

    large=small=a[0];
    index1=index2=0;

    for(i=0;i<10;i++)
    {
        //largest integer
        if (a[i]>large)
        {
            large = a[i];
            index1=i;
        }
        //smallest integer
        if (a[i]<small)
        {
            small= a[i];
            index2=i;
```

input

```
Enter 10 integers 9 8 7 6 5 4 3 2 1 0
Largest integer among  the given integers is 9 with index: a[1]
Smallest integer among  the given integers is 0 with index: a[10]
```

PROGRAM-50

OBJECTIVE: Program to display the index of smallest and largest element in 3X4 matrix of integers.

LANGUAGE USED: C

THEORY: Input of the numbers is taken from the user. For maximum and minimum values, first element is taken as maximum or minimum value and other elements are compare. Using if statement, maximum or minimum value is chosen. Finally the the values along with their index is displayed.

INPUT

```
/*CSE
Program to display the index of smallest and largest element in 3X4 matrix of integers.
11-Nov-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int a[3][4], large, small , i, j, rindex1, rindex2, cindex1, cindex2;
   printf("Enter elements\n");
   for(i=0;i<3;i++)
   {
      for(j=0;j<4;j++)
      scanf("%d", &a[i][j]);
   }
   large=a[0][0];
   rindex1=rindex2=cindex1=cindex2=0;
   for(i=0;i<3;i++)
   {
      for(j=0;j<4;j++)
      {
         if (a[i][j]>large)
         {
            rindex1=i;
            cindex1=j;
```

```
            large= a[i][j];
          }
           if (a[i][j]<small)
          {
             rindex2=i;
             cindex2=j;
             small= a[i][j];
          }
       }
    }
    printf("Largest among given integers is %d is a[%d] [%d]\n", large, rindex1+1 ,cindex1+1);
    printf("Smallest among given integers is %d is a[%d] [%d]\n", small, rindex2+1 ,cindex2+1);
    return 0;
}
```

OUTPUT

```
Enter elements
1 2 3 4
5 6 7 8
9 10 11 12
Largest among given integers is 12 is a[3] [4]
Smallest among given integers is 1 is a[1] [1]
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
#include <stdio.h>

int main()
{
    int a[3][4], large, small , i, j, rindex1, rindex2, cindex1, cindex2;

    printf("Enter elements\n");
    for(i=0;i<3;i++)
    {
        for(j=0;j<4;j++)
        scanf("%d", &a[i][j]);
    }

    large=a[0][0];
    rindex1=rindex2=cindex1=cindex2=0;

    for(i=0;i<3;i++)
    {
        for(j=0;j<4;j++)
        {
            if (a[i][j]>large)
            {
                rindex1=i;
```

input

```
Enter elements
1 2 3 4
5 6 7 8
9 10 11 12
Largest among given integers is 12 is a[3] [4]
```

main.c

```
    for(i=0;i<3;i++)
    {
        for(j=0;j<4;j++)
        {
            if (a[i][j]>large)
            {
                rindex1=i;
                cindex1=j;
                large= a[i][j];
            }
             if (a[i][j]<small)
            {
                rindex2=i;
                cindex2=j;
                small= a[i][j];
            }
        }
    }
    printf("Largest among given integers is %d is a[%d] [%d]\n", large, rindex1+1 ,cindex1+1);
    printf("Smallest among given integers is %d is a[%d] [%d]\n", small, rindex2+1 ,cindex2+1);

    return 0;
}

```

input

```
9 10 11 12
Largest among given integers is 12 is a[3] [4]
Smallest among given integers is 1 is a[1] [1]
```

PROGRAM-51

OBJECTIVE: Program that accepts N*N matrix as input and print transpose of this matrix.

LANGUAGE USED: C

THEORY: Input of the number of rows and columns and elements of both matrices is taken from the user. Transpose of a matrix is given by

T[i][j]=a[j][i]

Finally, the transpose matrix is displayed.

INPUT

```
/*CSE
Program that accepts N*N matrix as input and print transpose of this matrix.
11-Nov-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main()
{
   int r, c, a[100][100], t[100][100], i, j;
   printf("Enter the number of rows (upto 100) ");
   scanf("%d", &r);
   printf("Enter the number of columns (upto 100): ");
   scanf("%d", &c);
   printf("Enter elements of matrix\n");
   for (i = 0; i < r; i++)
      for (j = 0; j < c; j++)
      {
         printf("Enter element a%d%d:\n ", i + 1, j + 1);
         scanf("%d", &a[i][j]);
      }
   printf("transpose of matrix \n");
   for(i=0;i<c;i++)
   {
      for(j=0;j<r;j++)
      t[i][j]=a[j][i];
```

```
    }
    for(i=0;i<c;i++)
    {
       for(j=0;j<r;j++)
       {
       printf(" %d\t",t[i][j]);
       }
       printf("\n");
    }
    return 0;
}
```

OUTPUT

```
Enter the number of rows (upto 100) 2
Enter the number of columns (upto 100): 2
Enter elements of matrix
Enter element a11:
 1
 Enter element a12:
 1
 Enter element a21:
 2
 Enter element a22:
 2
 transpose of matrix
 1          2
 1          2
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
#include <stdio.h>

int main()

{
    int r, c, a[100][100], t[100][100], i, j;

    printf("Enter the number of rows (upto 100) ");
    scanf("%d", &r);
    printf("Enter the number of columns (upto 100): ");
    scanf("%d", &c);

    printf("Enter elements of matrix\n");
    for (i = 0; i < r; i++)
        for (j = 0; j < c; j++)
        {
            printf("Enter element a%d%d:\n ", i + 1, j + 1);
            scanf("%d", &a[i][j]);
        }

    printf("transpose of matrix \n");
    for(i=0;i<c;i++)
```

input

```
Enter the number of rows (upto 100) 2
Enter the number of columns (upto 100): 2
Enter elements of matrix
Enter element a11:
 1
Enter element a12:
```

main.c

```
            scanf("%d", &a[i][j]);
        }

    printf("transpose of matrix \n");
    for(i=0;i<c;i++)
    {
        for(j=0;j<r;j++)
        t[i][j]=a[j][i];

    }
    for(i=0;i<c;i++)
    {
        for(j=0;j<r;j++)
        {
        printf(" %d\t",t[i][j]);
        }
        printf("\n");
    }

    return 0;
}

```

input

```
 2
Enter element a22:
 2
transpose of matrix
 1       2
 1       2
```

PROGRAM-52

OBJECTIVE: Program to accept two matrices of some order. (Order must be given by user) and find out the sum of these matrices and print the sum of matrices.

LANGUAGE USED: C

THEORY: Input of the number of rows and columns and elements of both matrices is taken from the user. If order of the matrices is same then sum is calculated by

$$S[i][j]=a[i][j]+b[i][j]$$

Finally, the sum of matrices is displayed. Else, an appropriate message is displayed.

INPUT

```
/*CSE

Program to accept two matrices of some order. (Order must be given by user) and find out the sum of these matrices and print the sum of matrices.

11-Nov-2020

By DRISHTI ARORA*/

#include <stdio.h>

int main()

{

    int r1, c1, r2, c2, a[100][100], b[100][100], s[100][100], i, j;

  //first matrix

  printf("Enter the number of rows (upto 100) ");

  scanf("%d", &r1);

  printf("Enter the number of columns (upto 100): ");

  scanf("%d", &c1);

  printf("Enter elements of 1st matrix\n");

  for (i = 0; i < r1; i++){

    for (j = 0; j < c1; j++)

    {

      printf("Enter element a%d%d:\n ", i + 1, j + 1);

      scanf("%d", &a[i][j]);
```

```
    }}
  //second matrix
  printf("Enter the number of rows (upto 100) ");
  scanf("%d", &r2);
  printf("Enter the number of columns (upto 100): ");
  scanf("%d", &c2);
  printf("Enter elements of 2nd matrix\n");
  for (i = 0; i < r2; i++){
    for (j = 0; j < c2; j++)
    {
      printf("Enter element a%d%d:\n ", i + 1, j + 1);
      scanf("%d", &b[i][j]);
    }}
  //addition of matrices
  if(r1==r2 && c1==c2)
  {
    printf("addition of matrices \n");
    for(i=0;i<r1;i++)
    {
      for(j=0;j<c1;j++)
      s[i][j]=a[i][j] + b[i][j];
    }
    for(i=0;i<r1;i++)
    {
      for(j=0;j<c1;j++)
      printf(" %d\t",s[i][j]);
      printf("\n");
    }
  }
  else
  printf("Addition of matrices is not possible.");
  return 0;
}
```

OUTPUT

```
Enter the number of rows (upto 100) 2
Enter the number of columns (upto 100): 2
Enter elements of 1st matrix
Enter element a11:
1
Enter element a12:
1
Enter element a21:
1
Enter element a22:
1
Enter the number of rows (upto 100) 2
Enter the number of columns (upto 100): 2
Enter elements of 2nd matrix
Enter element a11:
1
Enter element a12:
1
Enter element a21:
1
Enter element a22:
1
addition of matrices
2       2
2       2
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
{
    int r1, c1, r2, c2, a[100][100], b[100][100], s[100][100], i, j;

//first matrix
printf("Enter the number of rows (upto 100) ");
scanf("%d", &r1);
printf("Enter the number of columns (upto 100): ");
scanf("%d", &c1);

printf("Enter elements of 1st matrix\n");
for (i = 0; i < r1; i++)
    for (j = 0; j < c1; j++)
    {
        printf("Enter element a%d%d:\n ", i + 1, j + 1);
        scanf("%d", &a[i][j]);
    }

//second matrix
printf("Enter the number of rows (upto 100) ");
scanf("%d", &r2);
printf("Enter the number of columns (upto 100): ");
scanf("%d", &c2);
```

input

```
Enter the number of rows (upto 100) 2
Enter the number of columns (upto 100): 2
Enter elements of 1st matrix
Enter element a11:
 1
Enter element a12:
```

main.c

```c
    printf("Enter elements of 2nd matrix\n");
    for (i = 0; i < r2; i++)
        for (j = 0; j < c2; j++)
        {
            printf("Enter element a%d%d:\n ", i + 1, j + 1);
            scanf("%d", &b[i][j]);
        }

    //addition of matrices
    if(r1==r2 && c1==c2)
    {
        printf("addition of matrices \n");
        for(i=0;i<r1;i++)
        {
            for(j=0;j<c1;j++)
            s[i][j]=a[i][j] + b[i][j];
        }
        for(i=0;i<r1;i++)
        {
            for(j=0;j<c1;j++)
            printf(" %d\t",s[i][j]);
            printf("\n");
```

input

```
nter the number of rows (upto 100) 2
nter the number of columns (upto 100): 2
nter elements of 2nd matrix
nter element a11:
1
nter element a12:
```

main.c

```
34
35      //addition of matrices
36      if(r1==r2 && c1==c2)
37      {
38          printf("addition of matrices \n");
39          for(i=0;i<r1;i++)
40          {
41              for(j=0;j<c1;j++)
42              s[i][j]=a[i][j] + b[i][j];
43          }
44          for(i=0;i<r1;i++)
45          {
46              for(j=0;j<c1;j++)
47              printf(" %d\t",s[i][j]);
48              printf("\n");
49          }
50      }
51      else
52      printf("Addition of matrices is not possible.");
53      return 0;
54  }
55
```

input

```
1
Enter element a22:
1
addition of matrices
2       2
2       2
```

PROGRAM-53

OBJECTIVE: Program to find out the product/Multiplication of two matrices and print the product matrix (order of matrices must be given by user).

LANGUAGE USED: C

THEORY: Input of the number of rows and columns and elements of both matrices is taken from the user. If the number of columns of first matrix is equal to number of rows of second matrix, then product is calculated with the help of nested for loops. Finally, the product is displayed. Else, an appropriate is message is printed.

INPUT

```
/*CSE

Program to find out the product/Multiplication of two matrices and print the product matrix (order of matrices must be given by user).

11-Nov-2020

By DRISHTI ARORA*/

#include <stdio.h>

int main()

{

   int r1, c1, r2, c2, a[100][100], b[100][100], c[100][100], i, j, k;

   //first matrix

   printf("Enter the number of rows (upto 100) ");

   scanf("%d", &r1);

   printf("Enter the number of columns (upto 100): ");

   scanf("%d", &c1);

   printf("Enter elements of 1st matrix\n");

   for (i = 0; i < r1; i++)

      for (j = 0; j < c1; j++)

      {

         printf("Enter element a%d%d:\n ", i + 1, j + 1);

         scanf("%d", &a[i][j]);

      }

   //second matrix

   printf("Enter the number of rows (upto 100) ");

   scanf("%d", &r2);
```

```
    printf("Enter the number of columns (upto 100): ");
    scanf("%d", &c2);
    printf("Enter elements of 2nd matrix\n");
    for (i = 0; i < r2; i++)
      for (j = 0; j < c2; j++)
      {
        printf("Enter element a%d%d:\n ", i + 1, j + 1);
        scanf("%d", &b[i][j]);
      }
    //Mutiplication of Matrices
    if (r2=c1)
    {
      printf("By multiplying the 2 matrix we get \n");
      for(i=0;i<r1;i++)
      {
        for(j=0;j<c2;j++)
        {
          c[i][j]=0;
          for(k=0;k<r2;k++)
          c[i][j]=c[i][j]+(a[i][k]*b[k][j]);
        }
      }
      for(i=0;i<r1;i++)
      {
        for(j=0;j<c2;j++)
        printf(" %d",c[i][j]);
        printf("\n");
      }
    }
    else
    printf("Multiplication is not possible.");
    return 0;
}
```

OUTPUT

```
Enter the number of rows (upto 100) 2
Enter the number of columns (upto 100): 3
Enter elements of 1st matrix
Enter element a11:
1
Enter element a12:
1
Enter element a13:
1
Enter element a21:
1
Enter element a22:
1
Enter element a23:
1
Enter the number of rows (upto 100) 3
Enter the number of columns (upto 100): 2
Enter elements of 2nd matrix
Enter element a11:
1
Enter element a12:
1
Enter element a21:
1
Enter element a22:
1
Enter element a31:
1
Enter element a32:
1
By multiplying the 2 matrix we get
3 3
3 3
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
#include <stdio.h>
int main()
{
    int r1, c1, r2, c2, a[100][100], b[100][100], c[100][100], i, j, k;

    //first matrix
    printf("Enter the number of rows (upto 100) ");
    scanf("%d", &r1);
    printf("Enter the number of columns (upto 100): ");
    scanf("%d", &c1);

    printf("Enter elements of 1st matrix\n");
    for (i = 0; i < r1; i++)
        for (j = 0; j < c1; j++)
        {
            printf("Enter element a%d%d:\n ", i + 1, j + 1);
            scanf("%d", &a[i][j]);
        }
```

input

```
Enter the number of rows (upto 100) 2
Enter the number of columns (upto 100): 3
Enter elements of 1st matrix
Enter element a11:
 1
Enter element a12:
 1
Enter element a13:
 1
```

main.c

```c
    //second matrix
    printf("Enter the number of rows (upto 100) ");
    scanf("%d", &r2);
    printf("Enter the number of columns (upto 100): ");
    scanf("%d", &c2);

    printf("Enter elements of 2nd matrix\n");
    for (i = 0; i < r2; i++)
        for (j = 0; j < c2; j++)
        {
            printf("Enter element a%d%d:\n ", i + 1, j + 1);
            scanf("%d", &b[i][j]);
        }

    //Mutiplication of Matrices
    if (r2=c1)
    {
        printf("By multiplying the 2 matrix we get \n");
```

input

```
Enter the number of rows (upto 100) 3
Enter the number of columns (upto 100): 2
Enter elements of 2nd matrix
Enter element a11:
 1
Enter element a12:
 1
Enter element a21:
 1
```

main.c

```
35      if (r2=c1)
36      {
37          printf("By multiplying the 2 matrix we get \n");
38          for(i=0;i<r1;i++)
39          {
40              for(j=0;j<c2;j++)
41              {
42                  c[i][j]=0;
43                  for(k=0;k<r2;k++)
44                  c[i][j]=c[i][j]+(a[i][k]*b[k][j]);
45              }
46          }
47          for(i=0;i<r1;i++)
48          {
49              for(j=0;j<c2;j++)
50              printf(" %d",c[i][j]);
51              printf("\n");
52          }
53      }
54      else
55      printf("Multiplication is not possible.");
56      return 0;
57  }
```

input

```
 1
By multiplying the 2 matrix we get
 3 3
 3 3
```

PROGRAM-54

OBJECTIVE: Program to accept two matrices of some order. (Order must be given by user) and find out the subtraction of these matrices and print the difference of matrices.

LANGUAGE USED: C

THEORY: Input of the number of rows and columns and elements of both matrices is taken from the user. If order of the matrices is same then difference is calculated by

s[i][j]=a[i][j]-b[i][j]

Finally, the difference of matrices is displayed. Else, an appropriate message is displayed.

INPUT

```
/*CSE

Program to accept two matrices of some order. (Order must be given by user) and find out the subtraction of these matrices and print the difference of matrices.

11-Nov-2020

By DRISHTI ARORA*/

#include <stdio.h>

int main()

{

    int r1, c1, r2, c2, a[100][100], b[100][100], s[100][100], i, j;

  //first matrix

  printf("Enter the number of rows (upto 100) ");

  scanf("%d", &r1);

  printf("Enter the number of columns (upto 100): ");

  scanf("%d", &c1);

  printf("Enter elements of 1st matrix\n");

  for (i = 0; i < r1; i++)

    for (j = 0; j < c1; j++)

    {

      printf("Enter element a%d%d:\n ", i + 1, j + 1);

      scanf("%d", &a[i][j]);

    }
```

```
    //second matrix
    printf("Enter the number of rows (upto 100) ");
    scanf("%d", &r2);
    printf("Enter the number of columns (upto 100): ");
    scanf("%d", &c2);
    printf("Enter elements of 2nd matrix\n");
    for (i = 0; i < r2; i++)
       for (j = 0; j < c2; j++)
       {
          printf("Enter element a%d%d:\n ", i + 1, j + 1);
          scanf("%d", &b[i][j]);
       }
    //Subtraction of matrices
    if(r1==r2 && c1==c2)
    {
       printf("Subtraction of matrices \n");
       for(i=0;i<r1;i++)
       {
          for(j=0;j<c1;j++)
          s[i][j]=a[i][j] - b[i][j];
       }
       for(i=0;i<r1;i++)
       {
          for(j=0;j<c1;j++)
          printf(" %d\t",s[i][j]);
          printf("\n");
       }
    }
    else
    printf("Subtraction of matrices is not possible.");
    return 0;
}
```

OUTPUT

```
Enter the number of rows (upto 100) 2
Enter the number of columns (upto 100): 2
Enter elements of 1st matrix
Enter element a11:
2
Enter element a12:
2
Enter element a21:
2
Enter element a22:
2
Enter the number of rows (upto 100) 2
Enter the number of columns (upto 100): 2
Enter elements of 2nd matrix
Enter element a11:
1
Enter element a12:
1
Enter element a21:
1
Enter element a22:
1
Subtraction of matrices
1       1
1       1
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
#include <stdio.h>

int main()
{
        int r1, c1, r2, c2, a[100][100], b[100][100], s[100][100], i, j;

    //first matrix
    printf("Enter the number of rows (upto 100) ");
    scanf("%d", &r1);
    printf("Enter the number of columns (upto 100): ");
    scanf("%d", &c1);

    printf("Enter elements of 1st matrix\n");
    for (i = 0; i < r1; i++)
        for (j = 0; j < c1; j++)
        {
            printf("Enter element a%d%d:\n ", i + 1, j + 1);
            scanf("%d", &a[i][j]);
        }

    //second matrix
    printf("Enter the number of rows (upto 100) ");
```

input

```
Enter the number of rows (upto 100) 2
Enter the number of columns (upto 100): 2
Enter elements of 1st matrix
Enter element a11:
 2
Enter element a12:
```

main.c

```c
    //second matrix
    printf("Enter the number of rows (upto 100) ");
    scanf("%d", &r2);
    printf("Enter the number of columns (upto 100): ");
    scanf("%d", &c2);

    printf("Enter elements of 2nd matrix\n");
    for (i = 0; i < r2; i++)
        for (j = 0; j < c2; j++)
        {
            printf("Enter element a%d%d:\n ", i + 1, j + 1);
            scanf("%d", &b[i][j]);
        }

    //Subtraction of matrices
    if(r1==r2 && c1==c2)
    {
        printf("Subtraction of matrices \n");
        for(i=0;i<r1;i++)
        {
            for(j=0;j<c1;j++)
            s[i][j]=a[i][j] - b[i][j];
```

input

```
Enter elements of 2nd matrix
Enter element a11:
 1
Enter element a12:
 1
Enter element a21:
```

main.c

```
34
35      //Subtraction of matrices
36      if(r1==r2 && c1==c2)
37      {
38          printf("Subtraction of matrices \n");
39          for(i=0;i<r1;i++)
40          {
41              for(j=0;j<c1;j++)
42              s[i][j]=a[i][j] - b[i][j];
43          }
44          for(i=0;i<r1;i++)
45          {
46              for(j=0;j<c1;j++)
47              printf(" %d\t",s[i][j]);
48              printf("\n");
49          }
50      }
51      else
52      printf("Subtraction of matrices is not possible.");
53      return 0;
54  }
55
```

input

```
 1
Enter element a22:
 1
Subtraction of matrices
 1       1
 1       1
```

PROGRAM-55

OBJECTIVE: Program to implement Simple Calculator (Addition, Subtraction, Multiplication, Division) using the concept of function.

LANGUAGE USED: C

THEORY: Input of the values is taken from the user. The function factorial is called by caller i.e. main function. Factorial is calculated using for l

INPUT

```
/*CSE

Program to implement Simple Calculator (Addition, Subtraction, Multiplication, Division) using the concept of function

11-Nov-2020

By DRISHTI ARORA*/

#include <stdio.h>

float sum(int first, int second)

{

   float sum;

   sum=first+second;

   printf("%f", sum);

}

float diff(int first, int second)

{

   float diff;

   diff=first-second;

   printf("%f", diff);

}

float prod(int first, int second)

{

   float prod;

   prod=first*second;

   printf("%f", prod);

}

float quo(int first, int second)

{
```

```
    float quo;
    quo=(float) first/second;
    printf("%f", quo);
}
int main()
{
    int choice;
    float first, second;
    printf("Enter an operator (1,2,3,4)for(+,-,*,/)");
    scanf("%d", &choice);
    printf("Enter two operands");
    scanf("%f %f", &first, &second);
    switch (choice)
    {
    case 1:
        sum(first,second);
        break;
    case 2:
        diff(first,second);
        break;
    case 3:
        prod(first,second);
        break;
    case 4:
        quo(first,second);
        break;
    default:
        printf("Enter another choice");
    }
    return 0;
}
```

OUTPUT

Enter an operator (1,2,3,4)for(+,-,*,/)

3

Enter two operands

3

3

9.000000

…Program finished with exit code 0

Press ENTER to exit console.

main.c

```c
#include <stdio.h>

float sum(int first, int second)
{
    float sum;
    sum=first+second;
    printf("%f", sum);
}
float diff(int first, int second)
{
    float diff;
    diff=first-second;
    printf("%f", diff);
}
float prod(int first, int second)
{
    float prod;
    prod=first*second;
    printf("%f", prod);
}
float quo(int first, int second)
{
    float quo;
    quo=(float) first/second;
    printf("%f", quo);
}

```

input

```
Enter an operator (1,2,3,4)for(+,-,*,/)
3
Enter two operands
3
3
9.000000
```

main.c

```
}

int main()
{
    int choice;
    float first, second;
    printf("Enter an operator (1,2,3,4)for(+,-,*,/)");
    scanf("%d", &choice);
    printf("Enter two operands");
    scanf("%f %f", &first, &second);
    switch (choice)
    {
    case 1:
        sum(first,second);
        break;
    case 2:
        diff(first,second);
        break;
    case 3:
        prod(first,second);
        break;
    case 4:
        quo(first,second);
        break;
    default:
        printf("Enter another choice");
    }
```

input

```
Enter two operands
3
3
9.000000

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

PROGRAM-56

OBJECTIVE: Program to swap two values using function.

LANGUAGE USED: C

THEORY: Input of the values is taken from the user. The function swap is called by caller i.e. main function. Numbers are swapped with the help of a third variable.

INPUT

```
/*CSE
Program to swap two values using function
11-Nov-2020
By DRISHTI ARORA*/
#include <stdio.h>
void swap(int x, int y)
{
   int temp = x;
   x = y;
   y = temp;
}
int main()
{
   int x, y;
   printf("Enter Value of x and y \n");
   scanf("%d %d", &x, &y);
   swap(x, y);
   printf("After Swapping: x = %d, y = %d", y, x);
   return 0;
}
```

OUTPUT

```
Enter Value of x and y
1 2
After Swapping: x = 2, y = 1
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
#include <stdio.h>

void swap(int x, int y)
{
    int temp = x;
    x = y;
    y = temp;
}

int main()
{
    int x, y;
    printf("Enter Value of x and y \n");
    scanf("%d %d", &x, &y);

    swap(x, y);
    printf("After Swapping: x = %d, y = %d", y, x);

    return 0;
}
```

input

```
Enter Value of x and y
1 2
After Swapping: x = 2, y = 1

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

PROGRAM-57

OBJECTIVE: Program to Calculate the factorial of a number using function.

LANGUAGE USED: C

THEORY: Input of the values is taken from the user. The function factorial is called by caller i.e. main function. Factorial is calculated using for loop by multiplying numbers in decreasing order until 1.

INPUT

```
/*CSE
Program to Calculate the factorial of a number using function
11-Nov-2020
By DRISHTI ARORA*/
#include <stdio.h>
long factorial(int);
int main()
{
  int n;
  printf("Enter a number \n");
  scanf("%d", &n);
  printf("%d! = %ld\n", n, factorial(n));
  return 0;
}
long factorial (int n)
{
  int c;
  long fact = 1;
  for (c = 1; c <= n; c++)
    fact*=c;
  return fact;
}
```

OUTPUT

```
Enter a number
5
5! = 120
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
#include <stdio.h>

long factorial(int);

int main()
{
  int n;

  printf("Enter a number \n");
  scanf("%d", &n);

  printf("%d! = %ld\n", n, factorial(n));

  return 0;
}

long factorial(int n)
{
  int c;
  long fact = 1;

  for (c = 1; c <= n; c++)
```

input

```
Enter a number
5
5! = 120


...Program finished with exit code 0
```

PROGRAM-58

OBJECTIVE: Program to Calculate the factorial of a number using recursion.

LANGUAGE USED: C

THEORY: Input of the values is taken from the user. The function recursion is called by caller i.e. main function. Factorial is calculated using recursive function wherein the same function is called by itself until factorial is calculated from the input value to 1.

INPUT

```
/*CSE
Program to Calculate the factorial of a number using recursion.
11-Nov-2020
By DRISHTI ARORA*/
#include <stdio.h>
int main( )
{
    int a, fact ;
    printf ( "\nEnter any number " ) ;
    scanf ( "%d", &a ) ;
    fact = factorial ( a ) ;
    printf ( "Factorial value = %d", fact ) ;
   }
factorial ( int x )
{
   int f = 1, i ;
    for ( i = x ; i >= 1 ; i-- )
    f = f * i ;
    return ( f ) ;
}
```

OUTPUT

```
Enter any number 5
Factorial value = 120
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
#include <stdio.h>

int main( )
{
     int a, fact ;
     printf ( "\nEnter any number " ) ;
     scanf ( "%d", &a ) ;

     fact = factorial ( a ) ;
     printf ( "Factorial value = %d", fact ) ;
    }
factorial ( int x )
{
    int f = 1, i ;
     for ( i = x ; i >= 1 ; i-- )
     f = f * i ;
     return ( f ) ;
}
```

input

```
Enter any number 5
Factorial value = 120

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

PROGRAM-59

OBJECTIVE: Program to check whether a number is even or odd using functions.

LANGUAGE USED: C

THEORY: Use the concept of functions (pass by value) to first get the value from the user in the main function and then check the number for even or odd by using functions.

INPUT

```
/*CSE
Program to check whether a number is even or odd using functions.
By DRISHTI ARORA*/
#include <stdio.h>
void evenodd(int num);
int main()
{
   int num;
   printf("enter any number");
   scanf("%d", &num);
   evenodd(num);
   return 0;
}
void evenodd(int num)
{
   if(num%2==0)
   printf("%d is an even number", num);
   else
   printf("%d is an odd number", num);
}
```

OUTPUT

```
enter any number 36
36 is an even number
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
#include <stdio.h>
void evenodd(int num);

int main()
{
    int num;
    printf("enter any number");
    scanf("%d", &num);
    evenodd(num);

    return 0;
}

void evenodd(int num)
{
    if(num%2==0)
    printf("%d is an even number", num);
    else
    printf("%d is an odd number", num);
}
```

input

```
enter any number 36
36 is an even number

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

PROGRAM-60

OBJECTIVE: Program to check whether a number is Prime, Armstrong or perfect number using functions.

LANGUAGE USED: C

THEORY: Use the concept of functions (pass by value) to first get the value from the user in the main function and then check the number for prime, Armstrong or Perfect by performing the operations in different functions.

INPUT

```
/*CSE
Program to check whether a number is Prime, Armstrong or perfect number using functions.
By DRISHTI ARORA*/
#include <stdio.h>
void prime(int num);
void armstrong(int num);
void perfect(int num);
int main()
{
   int num;
   printf("enter any number");
   scanf("%d", &num);
   prime(num);
   armstrong(num);
   perfect(num);
   return 0;
}
void prime(int num)
{
  int flag=0, i;
  for(i=2;i<=num/2;i++)
  {
     if(num%2==0)
     flag=1;
```

```
  }
  if(flag==1)
  {
     printf("It is not a prime number\n");
  }
  else
  {
     printf("It is a prime number\n");
  }
}
void armstrong(int num)
{
  int rem, sum=0, onum;
  onum=num;
  while(num!=0)
  {
      rem=num%10;
      sum+= rem*rem*rem;
      num/=10;
  }
  if(onum==sum)
  printf("It is an armstrong number\n");
  else
  printf("It is not an armstrong number\n");
}
void perfect(int num)
{
  int sum=0, i, rem;
  for(i=1;i<=num-1;i++)
  {
     rem=num%i;
```

```
    if(rem==0)
    {
       sum+= rem;
    }
  }
  if(sum=num)
  printf("It is a perfect number\n");
  else
  printf("It is not a perfect number\n");
}
```

OUTPUT

```
enter any number 153
It is a prime number
It is an armstrong number
It is a perfect number
…Program finished with exit code 0
Press ENTER to exit console.
```

```c
#include <stdio.h>
void prime(int num);
void armstrong(int num);
void perfect(int num);

int main()
{
    int num;
    printf("enter any number");
    scanf("%d", &num);
    prime(num);
    armstrong(num);
    perfect(num);

    return 0;
}

void prime(int num)
{
   int flag=0, i;
   for(i=2;i<=num/2;i++)
   {
       if(num%2==0)
       flag=1;
   }
   if(flag==1)
   {
```

input

```
enter any number 153
It is a prime number
It is an armstrong number
It is a perfect number
```

```
    {
        printf("It is a prime number\n");
    }
}

void armstrong(int num)
{
    int rem, sum=0, onum;
    onum=num;
    while(num!=0)
    {
        rem=num%10;
        sum+= rem*rem*rem;
        num/=10;
    }
    if(onum==sum)
    printf("It is an armstrong number\n");
    else
    printf("It is not an armstrong number\n");
}

void perfect(int num)
{
    int sum=0, i, rem;
    for(i=1;i<=num-1;i++)
    {
        rem=num%i;
        if(rem==0)
        {
            sum+= rem;
        }
    }
    if(sum=num)
    printf("It is a perfect number\n");
    else
    printf("It is not a perfect number\n");
```

PROGRAM-61

OBJECTIVE: Program to find all prime numbers between given interval using functions.

LANGUAGE USED: C

THEORY: Use the concept of functions to first get the lower and upper limits form the user in the main, then check for the condition of prime or composite within the given limit and print all the prime numbers in a separate function.

INPUT

```
/*CSE
Program to find all prime numbers between given interval using functions.
By DRISHTI ARORA*/
#include <stdio.h>
void prime(int lower, int upper);
int main()
{
   int lower, upper;
   printf("enter the interval");
   scanf("%d %d", &lower, &upper);
   printf("Prime numbers are \n");
   prime(lower, upper);
   return 0;
}
void prime(int lower, int upper)
{
  int i, j;
   for(i=lower; i<=upper; i++)
   {
      int fact=0;
      for(j=2; j<=i/2; j++)
         {
         if(i%j==0)
         fact++;
         }
```

```
        if(fact==0)
   printf("%d " ,i);
   }
}
```

OUTPUT

```
enter the interval 1 37
Prime numbers are
1 2 3 5 7 11 13 17 19 23 29 31 37
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
#include <stdio.h>
void prime(int lower, int upper);

int main()
{
    int lower, upper;
    printf("enter the interval");
    scanf("%d %d", &lower, &upper);
    printf("Prime numbers are \n");
    prime(lower, upper);
    return 0;
}

void prime(int lower, int upper)
{
   int i, j;

    for(i=lower; i<=upper; i++)
    {
        int fact=0;
        for(j=2; j<=i/2; j++)
            {
            if(i%j==0)
            fact++;
            }
            if(fact==0)
    printf("%d " ,i);
    }
}
```

input

```
rime numbers are
 2 3 5 7 11 13 17 19 23 29 31 37

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

PROGRAM-62

OBJECTIVE: Program to print all strong numbers between given interval using functions.

LANGUAGE USED: C

THEORY: Use the concept of functions to first get the lower and upper limits form the user in the main, then check for the condition of strong number by using factorial and loops in the function to get the final printed numbers.

INPUT

```
/*CSE
Program to print all strong numbers between given interval using functions.
By DRISHTI ARORA*/
#include<stdio.h>
int main()
{
 int numbr,k,fact,rem,sum=0,input;
 int first,last;
 printf("Enter the first value: ");
 scanf("%d",&first);
 printf("Enter the last value: ");
 scanf("%d",&last);
 printf("The Strong numbers in the given range are: ");

 for(numbr=first; numbr <= last; numbr++)
 {
    input = numbr;
    sum=0;
    while(input>0)
    {
       k=1;
        fact=1;
        rem=input%10;
        while(k<=rem)
        {
```

```
            fact=fact*k;
            k++;
           }
         sum=sum+fact;
         input=input/10;
      }
      if(sum==numbr)
          printf("%d ",numbr);
  }
return 0;
}
```

OUTPUT

```
Enter the first value: 10
Enter the last value: 1000
The Strong numbers in the given range are: 145
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
int first,last;

printf("Enter the first value: ");
scanf("%d",&first);
printf("Enter the last value: ");
scanf("%d",&last);
printf("The Strong numbers in the given range are: ");

for(numbr=first; numbr <= last; numbr++)
{
    input = numbr;
    sum=0;
    while(input>0)
    {
        k=1;
         fact=1;
         rem=input%10;
         while(k<=rem)
         {
           fact=fact*k;
           k++;
         }

       sum=sum+fact;
       input=input/10;
    }

    if(sum==numbr)
        printf("%d ",numbr);
```

input

```
Enter the first value: 10
Enter the last value: 1000
The Strong numbers in the given range are: 145

...Program finished with exit code 0
```

PROGRAM-63

OBJECTIVE: Program to find power of any number using recursion.

LANGUAGE USED: C

THEORY: Use the concept of recursion and call the function fact within fact by returning the number x multiplies by the function taken for the next lower value i.e, x-1 till we get x<1 and the function returns 1.

INPUT

```
/*CSE
Program to find power of any number using recursion.
By DRISHTI ARORA*/
#include <stdio.h>
int power(int num, int expo);
int main()
{
   int num, expo, result;
   printf("enter the number and exponent");
   scanf("%d %d", &num, &expo);
   result=power(num, expo);
   printf("result=%d", result);
   return 0;
}
int power(int num, int expo)
{
   if (expo!= 0)
      return (num * power(num, expo- 1));
   else
      return 1;
}
```

OUTPUT

```
enter the number and exponent 3 4
result=81
…Program finished with exit code 0
```

main.c

```c
#include <stdio.h>
int power(int num, int expo);

int main()
{
    int num, expo, result;
    printf("enter the number and exponent");
    scanf("%d %d", &num, &expo);
    result=power(num, expo);
    printf("result=%d", result);
    return 0;
}

int power(int num, int expo)
{
    if (expo!= 0)
        return (num * power(num, expo- 1));
    else
        return 1;
}

```

input

```
enter the number and exponent 3 4
result=81

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

Press ENTER to exit console.

PROGRAM-64

OBJECTIVE: Declare a structure name student containing members name, roll_no, marks. Create an array of 30 such students. Write a program to read and display the contents of array.

LANGUAGE USED: C

THEORY: Use the concept of structures to form the structure required. Keep the structure variable as an array to store all the values as specified in the function.

INPUT

```
/*CSE

Declare a structure name student containing members name, roll_no, marks. Create an array of 30 such students. Write a program to read and display the contents of array.

By DRISHTI ARORA*/

#include <stdio.h>

   struct student

   {

      char name[20];

      int roll_no;

      int marks;

   } s[30];

int main()

{

   int i;

   for(i=0;i<30;i++)

   {

   printf("\nEnter the name of the student");

   scanf("%s", s[i].name);

   printf("\nEnter the roll number of the student");

   scanf("%d", &s[i].roll_no);

   printf("\nEnter the marks of the student");

   scanf("%d", &s[i].marks);

   }

   for(i=0;i<30;i++)

   {
```

```
    printf("\nStudent's Information");
    printf("\nName: %s", s[i].name);
    printf("\nRoll number: %d", s[i].roll_no);
    printf("\nMarks: %d", s[i].marks);
    }
    return 0;
}
```

OUTPUT

```
Enter the name of the student drishti
Enter the roll number of the student 108
Enter the marks of the student 100
Enter the name of the student kriti
Enter the roll number of the student 109
Enter the marks of the student 100
(…30 times)
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
#include <stdio.h>
    struct student
    {
        char name[20];
        int roll_no;
        int marks;
    } s[30];
int main()
{
    int i;
    for(i=0;i<30;i++)
    {
    printf("\nEnter the name of the student");
    scanf("%s", s[i].name);
    printf("\nEnter the roll number of the student");
    scanf("%d", &s[i].roll_no);
    printf("\nEnter the marks of the student");
    scanf("%d", &s[i].marks);
    }
    for(i=0;i<30;i++)
    {
    printf("\nStudent's Information");
    printf("\nName: %s", s[i].name);
    printf("\nRoll number: %d", s[i].roll_no);
    printf("\nMarks: %d", s[i].marks);
    }
    return 0;
```

input

```
Enter the name of the student drishti

Enter the roll number of the student 108

Enter the marks of the student 100

Enter the name of the student kriti
```

PROGRAM-65

OBJECTIVE: Simple database program in C which stores personal details of 100 persons such as Name, Date of Birth, Address, Phone number etc.

LANGUAGE USED: C

THEORY: Use the concept of structures to form the structure required. Keep the structure variable as an array to store all the values as specified in the function.

INPUT

```
/*CSE

Simple database program in C which stores personal details of 100 persons such as Name, Date of Birth, Address, Phone number etc.

By DRISHTI ARORA*/

#include <stdio.h>

 struct person

   {

      char name[20];

      int dob_date;

      int dob_month;

      int dob_year;

      int addressno;

      char address[50];

      long long int phoneno;

   } p[100];


int main()

{

   int i;

   for(i=0;i<100;i++)

   {

   printf("\nEnter the name");

   scanf("%s", p[i].name);

   printf("\nEnter the date of dob");

   scanf("%d", &p[i].dob_date);

   printf("\nEnter the month of date");
```

```
    scanf("%d", &p[i].dob_month);
    printf("\nEnter the year of dob");
    scanf("%d", &p[i].dob_year);
    printf("\nEnter the house no");
    scanf("%d", &p[i].addressno);
    printf("\nEnter the address");
    scanf("%s", p[i].address);
    printf("\nEnter the phone number");
    scanf("%lld", &p[i].phoneno);
    }
    for(i=0;i<100;i++)
    {
    printf("\nName:%s", p[i].name);
    printf("\nDOB:%d", p[i].dob_date);
    printf("%d", p[i].dob_month);
    printf("%d", p[i].dob_year);
    printf("\n%d", p[i].addressno);
    printf(" %s", p[i].address);
    printf("\n%lld", p[i].phoneno);
    }
    return 0;
}
```

OUTPUT

```
Enter the name drishti
Enter the date of dob 01
Enter the month of dob 10
Enter the year of dob 2002
Enter the house no 50
Enter the address pitampura
Enter the phone number 9876543210
(…100 times)
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
#include <stdio.h>
 struct person
    {
        char name[20];
        int dob_date;
        int dob_month;
        int dob_year;
        int addressno;
        char address[50];
        long long int phoneno;
    } p[100];

int main()
{
    int i;
    for(i=0;i<100;i++)
    {
    printf("\nEnter the name");
    scanf("%s", p[i].name);
    printf("\nEnter the date of dob");
    scanf("%d", &p[i].dob_date);
    printf("\nEnter the month of date");
    scanf("%d", &p[i].dob_month);
    printf("\nEnter the year of dob");
```

input

```
Enter the name drishti

Enter the date of dob 01

Enter the month of date 10

Enter the year of dob 2002

Enter the house no 50
```

main.c

```
23      scanf("%d", &p[i].dob_month);
24      printf("\nEnter the year of dob");
25      scanf("%d", &p[i].dob_year);
26      printf("\nEnter the house no");
27      scanf("%d", &p[i].addressno);
28      printf("\nEnter the address");
29      scanf("%s", p[i].address);
30      printf("\nEnter the phone number");
31      scanf("%lld", &p[i].phoneno);
32      }
33      for(i=0;i<100;i++)
34      {
35      printf("\nName:%s", p[i].name);
36      printf("\nDOB:%d", p[i].dob_date);
37      printf("-%d", p[i].dob_month);
38      printf("-%d", p[i].dob_year);
39      printf("\n%d", p[i].addressno);
40      printf(" %s", p[i].address);
41      printf("\n%lld", p[i].phoneno);
42      }
43      return 0;
44  }
45
46
```

input

```
Enter the address Pitampura

Enter the phone number 9876543210

Enter the name kriti

Enter the date of dob 13

Enter the month of date 05
```

PROGRAM-66

OBJECTIVE: Program in 'C' that compares two given dates. To store a date, use a struct that contains three members namely day, month, and year. If the dates are equal, then display message as "equal" otherwise "Unequal

LANGUAGE USED: C

THEORY: Use the concept of structures to form the structure required. Keep two structure variables for 2 dates and compare them element by element. If all elements of both dates are same, they are equal. Else, they are not equal.

INPUT

```
/*CSE

Program in 'C' that compares two given dates. To store a date, use a struct that contains three members namely day, month,and year. If the dates are equal, then display message as "equal" otherwise "Unequal

By DRISHTI ARORA*/

#include <stdio.h>

   struct day

   {

      int day;

      int month;

      int year;

   } d[2];

int main()

{

   int i;

   for(i=0;i<2;i++)

   {

   printf("\nEnter the day");

   scanf("%d", &d[i].day);

   printf("\nEnter the month");

   scanf("%d", &d[i].month);

   printf("\nEnter the year");

   scanf("%d", &d[i].year);

   }

   for(i=0;i<2;i++)
```

```
    {
     printf("\nDate is %d-%d-%d", d[i].day, d[i].month, d[i].year);
    }
   if(d[0].day==d[1].day && d[0].month==d[1].month && d[0].year==d[1].year)
   printf("\nDates are equal");
    return 0;
}
```

OUTPUT

```
Enter the day 02
Enter the month 10
Enter the year 2002
Enter the day 02
Enter the month 10
Enter the year 2002
Date is 2-10-2002
Date is 2-10-2002
Dates are equal
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
    struct day
    {
        int day;
        int month;
        int year;
    } d[2];
int main()
{
    int i;
    for(i=0;i<2;i++)
    {
    printf("\nEnter the day");
    scanf("%d", &d[i].day);
    printf("\nEnter the month");
    scanf("%d", &d[i].month);
    printf("\nEnter the year");
    scanf("%d", &d[i].year);
    }
    for(i=0;i<2;i++)
    {
    printf("\nDate is %d-%d-%d", d[i].day, d[i].month, d[i].year);
    }
   if(d[0].day==d[1].day && d[0].month==d[1].month && d[0].year==d[1].year)
   printf("\nDates are equal");
    return 0;
```

input

```
Enter the day 02

Enter the month 10

Enter the year 2002

Date is 2-10-2002
Date is 2-10-2002
Dates are equal
```

PROGRAM-67

OBJECTIVE: Program which reads your name from the keyboard and outputs a list of ASCII codes, which represent your name.

LANGUAGE USED: C

THEORY: Use a for loop to read each character form the character array that contains the name, and print that character along with its ASCII Value.

INPUT

```
/*CSE

Program which reads your name from the keyboard and outputs a list of ASCII codes, which represent your name.

By DRISHTI ARORA*/

#include <stdio.h>

#include <string.h>

int main()

{

   int i;

   char name[20];

   printf("Enter the name");

   gets(name);

   printf("ASCII Code\n");

   for(i=0; i<strlen(name); i++)

   {

      printf("%d\n", name[i]);

   }

   return 0;

}
```

OUTPUT

```
Enter the name computer

ASCII Code

99

111

109

112

117

116

101
```

114

…Program finished with exit code 0

Press ENTER to exit console.

main.c

```c
#include <stdio.h>
#include <string.h>
int main()
{
    int i;
    char name[20];
    printf("Enter the name");
    gets(name);
    printf("ASCII Code\n");
    for(i=0; i<strlen(name); i++)
    {
        printf("%d\n", name[i]);
    }

    return 0;
}
```

input

```
Enter the name computer
ASCII Code
32
99
111
109
112
117
116
101
114
```

PROGRAM-68

OBJECTIVE: Program which will read a text and count all occurrences of all characters which are part of text.

LANGUAGE USED: C

THEORY: Use a character array to store the text and an integer array (first initialized to 0) to store the occurrence of each character of the text by taking a loop from 0 till 256 that is, the ASCII Value of the last character (counter).

INPUT

```
/*CSE

Program which will read a text and count all occurrences of all characters which are part of text.

By DRISHTI ARORA*/

#include <stdio.h>

#include <string.h>

int main()

{

   char str[50];

   int c[26]={0},n;

   int i;

   int n1,n2;

   printf("\n Enter the String\n");

   gets(str);

   for(i=0;i<str[i]!='\0';i++)

   {

      n=str[i]-'a';


    c[n]++;

   }

   for(i=0;i<26;i++)

   {

      printf("\n %c  =%d", i+'a', c[i]);

   }
```

```
    return 0;
}
```

OUTPUT

```
Enter the String
Learn C programming language

a  =4
b  =0
c  =0
d  =0
e  =2
f  =0
g  =4
h  =0
i  =1
j  =0
k  =0
l  =1
m  =2
n  =3
o  =1
p  =1
q  =0
r  =3
s  =0
t  =0
u  =1
v  =0
w  =0
x  =0
y  =0
z  =0
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

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

int main()
{
    char str[50];
    int c[26]={0},n;
    int i;
    int n1,n2;
    printf("\nEnter the String\n");
    gets(str);

    for(i=0;i<str[i]!='\0';i++)
    {
        n=str[i]-'a';
        c[n]++;
    }

    for(i=0;i<26;i++)
    {
        printf("\n%c  =%d", i+'a', c[i]);
    }
    return 0;
}
```

input

```
Enter the String
Learn C programming language

a  =4
b  =0
c  =0
d  =0
e  =2
f  =0
```

PROGRAM-69

OBJECTIVE: Program which will read a text and count all occurrences of a particular word.

LANGUAGE USED: C

THEORY: Use a character array to store the text and another character array to store the word that we need to search for. Use for loop to copy the sentence word by word into another array and check if that word is equal to the word that we searched for till the length of the string is reached (till NULL character is reached)

INPUT

```
/*CSE
Program which will read a text and count all occurrences of a particular word.
By DRISHTI ARORA*/
#include <stdio.h>
#include <string.h>

int main()
{
   char str[50];
   char str1[20];
   int c1=0;
   int i;

   int n1,n2;
   printf("\nEnter the String\n");
   gets(str);
   printf("\nEnter the word to be searched \n");
   gets(str1);
   n1=strlen(str);
   n2=strlen(str1);
   for(i=0;i<n1;i++)
   {
      int found=1;
      for(int j=0;j<n2;j++)
```

```
        {
            if(str[i+j]!=str1[j])
            {
            found=0;
            break;
            }
        }
        if(found==1)
        {
            c1++;
        }
    }
    printf("%d\n", c1);
    return 0;
}
```

OUTPUT

```
Enter the String
yes yes no no no yes no

Enter the word to be searched
no
4
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```
    int i;

    int n1,n2;
    printf("\nEnter the String\n");
    gets(str);
    printf("\nEnter the word to be searched \n");
    gets(str1);
    n1=strlen(str);
    n2=strlen(str1);

    for(i=0;i<n1;i++)
    {
        int found=1;
        for(int j=0;j<n2;j++)
        {
            if(str[i+j]!=str1[j])
            {
            found=0;
            break;
            }

        }
        if(found==1)
        {
            c1++;
        }
    }
    printf("%d\n", c1);
```

input

```
Enter the String
yes yes no no no yes no

Enter the word to be searched
no
4
```

PROGRAM-70

OBJECTIVE: Program which reads a string from the keyboard and determines whether the string is a palindrome (Ignore Capitalization)

LANGUAGE USED: C

THEORY: Use a character array to store the text and find its length by using strlen string function. Use a for loop to go from 0 till n/2 and check if the first character and its corresponding last character are equal. If yes, increase the counter by one. If the final value of the counter is the same as the loop element value, the string is a palindrome.

INPUT

```
/*CSE

Program which reads a string from the keyboard and determines whether the string is a palindrome (Ignore Capitalization)

By DRISHTI ARORA*/

#include <stdio.h>

#include <string.h>

int main()

{

   char s[1000];

   int i,n,c=0;

   printf("Enter  the string : ");

   scanf("%s", s);

   n=strlen(s);

   for(i=0;i<n/2;i++)

   {

           if(s[i]==s[n-i-1])

           c++;

           }

           if(c==i)

              printf("string is palindrome");

   else

      printf("string is not palindrome");

   return 0;

}
```

OUTPUT

Enter the string : naman

string is palindrome

…Program finished with exit code 0

Press ENTER to exit console.

main.c

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

int main()
{
    char s[1000];
    int i,n,c=0;

    printf("Enter  the string : ");
    scanf("%s", s);
    n=strlen(s);

    for(i=0;i<n/2;i++)
    {
        if(s[i]==s[n-i-1])
        c++;

    }
    if(c==i)
        printf("string is palindrome");
    else
        printf("string is not palindrome");

    return 0;
}
```

input

```
Enter  the string : naman
string is palindrome

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

PROGRAM-71

OBJECTIVE: Write macro definition with arguments for calculation of simple interest and amount. Store these macro definitions in a file called 'Interest.h". Include this file in your program and use the macro definition for calculating simple interest and amount.

LANGUAGE USED: C

THEORY: Write the macro definitions in a separate file called "interest.h". Save that file and then include it in the main file (main.c) to calculate the Simple Interest.

INPUT

```
/*CSE

Write macro definition with arguments for calculation of simple interest and amount. Store these macro definitions in a file called 'Interest.h". Include this file in your program anduse the macro definition for calculating simple interest and amount.

By DRISHTI ARORA*/
```

interest.h

```
#define SI(p, t, r)  ( (p * t * r) / 100.0 )
#define AMT(p, t, r) ( SI(p, t, r) + p )
```

main.c

```
#include<stdio.h>
#include "interest.h"
int main()
{
   float p, t, r;
   printf("Enter principal amount\n");
   scanf("%f", &p);
   printf("Enter Rate of Interest\n");
   scanf("%f", &r);
   printf("Enter Time Period\n");
   scanf("%f", &t);
   printf("Simple Interest: %0.2f\n", SI(p, t, r));
   printf("Total Amount: %0.2f\n", AMT(p, t, r));
   return 0;
}
```

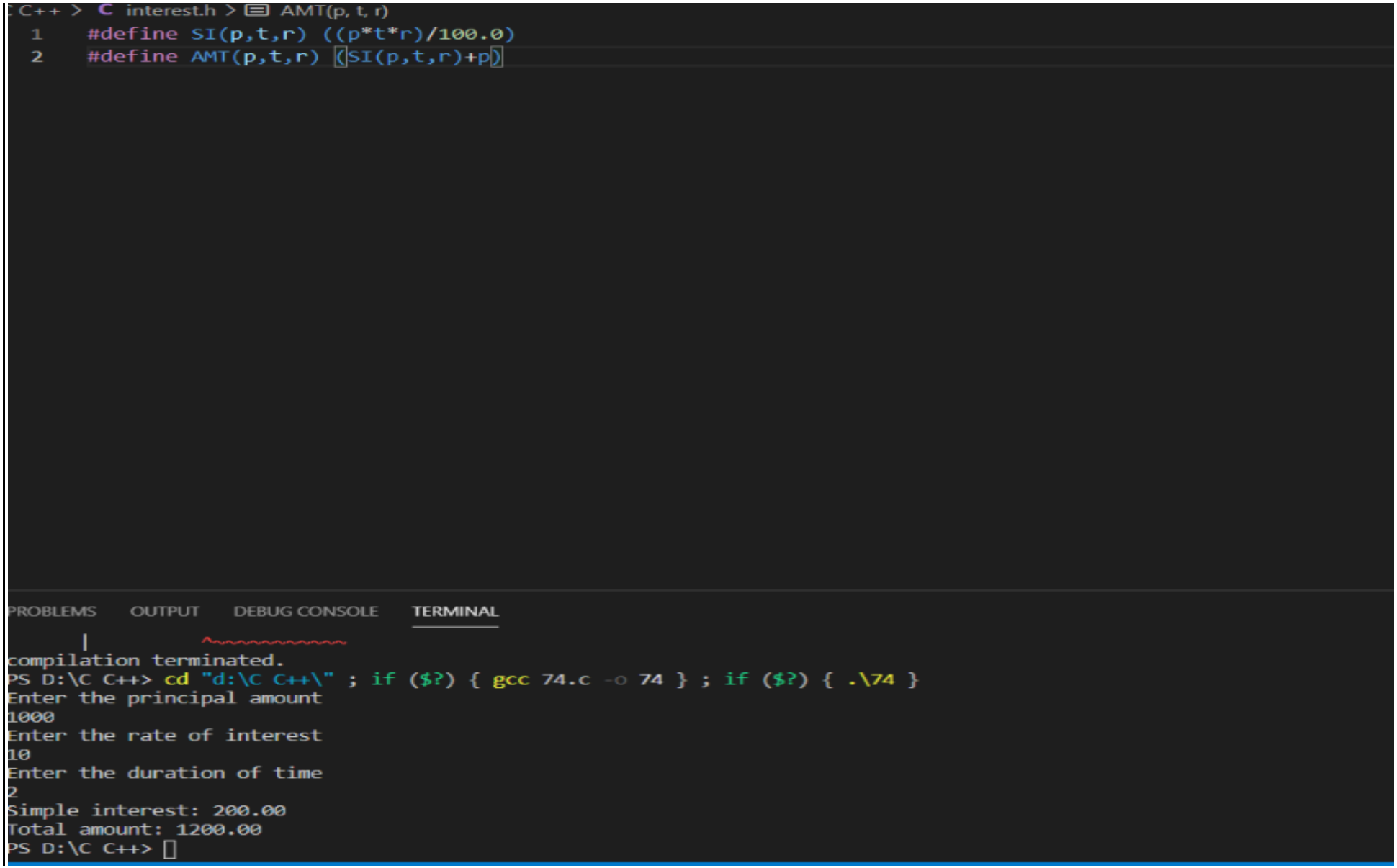
OUTPUT

```
Enter principal amount
1000
Enter Rate of Interest
10
Enter Time Period
2
Simple Interest: 200.00
Total Amount: 1200.00
```

```c
#define SI(p,t,r) ((p*t*r)/100.0)
#define AMT(p,t,r) (SI(p,t,r)+p)
#include"interest.h"

#include<stdio.h>



void main()
{
    float p,t,r;
    printf("Enter the principal amount\n");
    scanf("%f",&p);

    printf("Enter the rate of interest\n");
    scanf("%f",&r);

    printf("Enter the duration of time\n");
    scanf("%f",&t);

    printf("Simple interest: %0.2f\n",SI(p,t,r));
    printf("Total amount: %0.2f\n",AMT(p,t,r));

}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
      |          ^~~~~~~~~~~
compilation terminated.
PS D:\C C++> cd "d:\C C++\" ; if ($?) { gcc 74.c -o 74 } ; if ($?) { .\74 }
Enter the principal amount
1000
Enter the rate of interest
10
Enter the duration of time
2
Simple interest: 200.00
Total amount: 1200.00
PS D:\C C++>
```


C++ > C interest.h > AMT(p, t, r)
1 #define SI(p,t,r) ((p*t*r)/100.0)
2 #define AMT(p,t,r) (SI(p,t,r)+p)
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
compilation terminated.
PS D:\C C++> cd "d:\C C++\" ; if ($?) { gcc 74.c -o 74 } ; if ($?) { .\74 }
Enter the principal amount
1000
Enter the rate of interest
10
Enter the duration of time
2
Simple interest: 200.00
Total amount: 1200.00
PS D:\C C++>

PROGRAM-72

OBJECTIVE: Program to copy the contents of one file to another file

LANGUAGE USED: C

THEORY: Open a file (in write mode, by using a pointer) and get the numbers from the user. Close the file. Open another file in write mode (by using another pointer) along with the original file in read mode and copy the numbers from the original file to the new file by using getw and putw functions. Display the contents in the final file and then close both files.

INPUT

```
/*CSE

Program to copy the contents of one file to another file

By DRISHTI ARORA*/

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

void main()
{
 FILE *fs;
fs=fopen("Source.dat","wb");

int i,num1,num2;
if(fs==NULL)
return(0);
printf("\n Enter 10 numbers: ");

for(i=0;i<10;i++)
{
  printf("\n");
  scanf("%d",&num1);
  putw(num1,fs);
}
fclose(fs);
FILE *ft;
fs=fopen("Source.dat","rb");
ft=fopen("Target.dat","wb");
if(fs==NULL)
{
   exit(0);
}
 for (i=0; i<10; i++)
 {
   num2=getw(fs);
  putw(num2,ft);
   }
```

```
    fclose(fs);
    fclose(ft);
printf("\n The final content in the second file is ");
ft=fopen("Target.dat","rb");
for(i=0;i<10;i++)
{
printf("%d\n",num2);
fclose(ft);
}
```

OUTPUT

```
Enter 10 numbers:
1
2
3
4
5
6
7
8
9
10

The final content in the second file is
1
2
3
4
5
6
7
8
9
10
```

PROGRAM-73

OBJECTIVE: Program which will store ten integers to one file and squares of these numbers to another file.

LANGUAGE USED: C

THEORY: Open a file (in write mode, by using a pointer) and get the numbers from the user. Close the file. Open another file in write mode (by using another pointer) along with the original file in read mode and copy the numbers from the original file to the new file by using getw and putw functions, but take the square of the numbers and store them in the new file. Display the contents in the new file and then close both files.

INPUT

```
/*CSE

Program which will store ten integers to one file and squares of these numbers to another file.

By DRISHTI ARORA*/

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

void main()
{
 FILE *fs;
fs=fopen("Source.dat","wb");

int i,num1,num2;
if(fs==NULL)
return(0);

for(i=0;i<10;i++)
{
   printf("\n Enter a number: ");
  scanf("%d",&num1);
  putw(num1,fs);
}
fclose(fs);
FILE *ft;
fs=fopen("Source.dat","rb");
ft=fopen("Target.dat","wb");
if(fs==NULL)
{
   exit(0);
}
 for (i=0; i<10; i++)
 {
```

```
   num2=getw(fs);
  putw(num1*num1,ft);
   }
      fclose(fs);
      fclose(ft);
printf("\n The final content in the second file is ");
ft=fopen("Target.dat","rb");
for(i=0;i<10;i++)
{
printf("%d\n",num2);
fclose(ft);
}
```

OUTPUT

```
Enter 10 numbers:
1
2
3
4
5
6
7
8
9
10

The final content in the second file is
1
4
9
16
25
36
49
64
81
100
```

PROGRAM-74

OBJECTIVE: Program which will store ten integers to one file and stores the odd and even numbers to respective files

LANGUAGE USED: C

THEORY: Open a file (in write mode, by using a pointer) and get the numbers from the user. Close the file. Open2 more files in write mode (by using another pointer) for storing odd and even numbers, along with the original file in read mode and copy the numbers from the original file to the new file by using getw and putw functions, by checking for the even condition. Display the contents in the new files for even and odd numbers and then close the files.

INPUT

```
/*CSE

Program which will store ten integers to one file and stores the odd and even numbers to respective files

By DRISHTI ARORA*/

#include <stdio.h>
#include<string.h>
#include<stdlib.h>
void main()
  {
     FILE *fs;
     fs=fopen("Source.dat","wb");
     int i,num1,num2,num3;
     if(fs==NULL)
        return(0);
     printf("\n Enter 10 numbers: ");
     for(i=0;i<10;i++)
        {
           scanf("%d",&num1);
           putw(num1,fs);
        }
     fclose(fs);

     FILE *fe,*fo;
     fs=fopen("Source.dat","rb");
     fe=fopen("Even.dat","wb");
     fo=fopen("Odd.dat","wb");
     if(fs==NULL)
        {
           exit(0);
        }
```

```
    for (i=0; i<10; i++)
       {
          num2=getw(fs);
          if(num2%2==0)
             {
                putw(num2,fe);
             }
          else
             {
                putw(num2,fo);
             }
       }
    fclose(fs);
    fclose(fe);
    fclose(fo);

    printf("\n The final content in the Even file is: ");
    fe=fopen("Even.dat","rb");
    for(i=0;i<10;i++)
       printf("%d\n",num2);

    printf("\n The final content in the Odd file is: ");
    fo=fopen("Odd.dat","rb");
    for(i=0;i<10;i++)
    printf("%d\n",num2);

    fclose(fe);
    fclose(fo);

}
```

PROGRAM-75

OBJECTIVE: Program to compare two given strings.

LANGUAGE USED: C

THEORY: Use a function to perform the task of strcmp in string function, by using pointers as the arguments and computing the final value of the subtraction of the 2 strings. If it is 0, the strings are equal.

INPUT

```
/*CSE
Program to compare two given strings.
By DRISHTI ARORA*/
#include <stdio.h>
int xtrcmp(char *s1,char *s2)
{
   while(*s1==*s2)
   {
      if(*s1=='\0')
      return(0);
      s1++;
      s2++;
    return(*s1-*s2);
   }
void main()
{
   char str1[20];
   char str2[20];
   int i=0;
   printf("\n Enter a string ");
   scanf("%s",str1);
   printf("\n Enter another string ");
   scanf("%s",str2);
   i=xtrcmp(str1,str2);
```

```
    if(i==0)
    printf("\n The strings are equal ");
    else
     printf("\n The strings are not equal ");
}
```

OUTPUT

```
Enter a string computer
Enter another string computer
The strings are equal
…Program finished with exit code 0
Press ENTER to exit console.
```

main.c

```c
#include <stdio.h>
int xtrcmp(char *s1,char *s2)
{
    while(*s1==*s2)
    {
        if(*s1=='\0')
        return(0);
        s1++;
        s2++;
     }
     return(*s1-*s2);
    }

void main()
{
    char str1[20];
    char str2[20];
    int i=0;
    printf("\n Enter a string ");
    scanf("%s",str1);
    printf("\n Enter another string ");
    scanf("%s",str2);
    i=xtrcmp(str1,str2);
    if(i==0)
    printf("\n The strings are equal ");
    else
     printf("\n The strings are not equal ");
```

input

```
Enter a string computer

Enter another string computer

The strings are equal
```