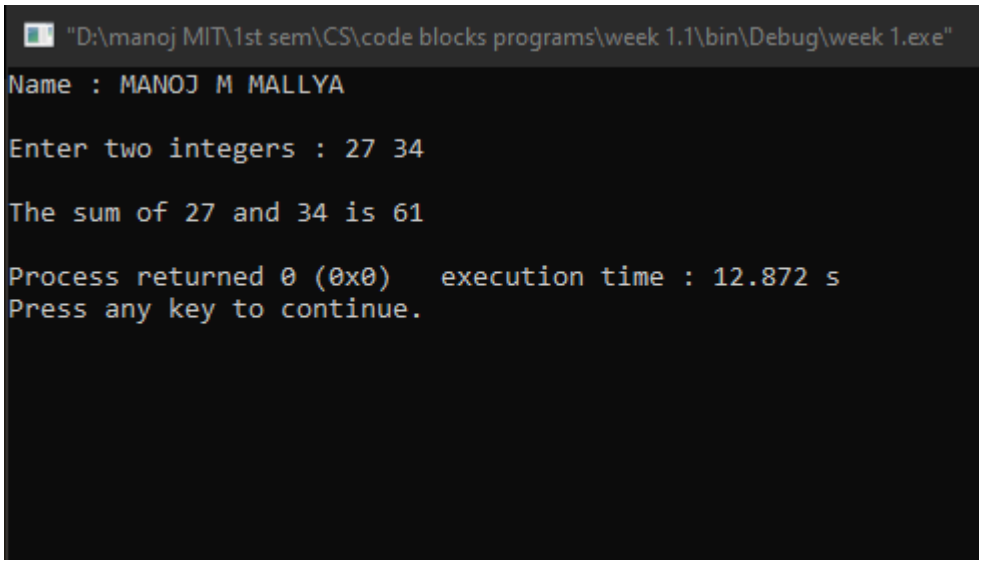
# Lab no: 1 – SIMPLE C PROGRAMS

Q1. Write a C program to add two integers a and b read through the keyboard. Display the result using third variable sum.

## Program:

```
/* Computing the sum of two numbers */

#include <stdio.h>

#include <stdlib.h>

int main()

{

   printf("Name : MANOJ M MALLYA\n\n");

   int a,b,sum;

   printf("Enter two integers : ");

   scanf("%d %d",&a,&b);

   sum = (a+b); // sum

   printf("\nThe sum of %d and %d is %d\n",a,b,sum);

   return 0;

}
```

## Output:

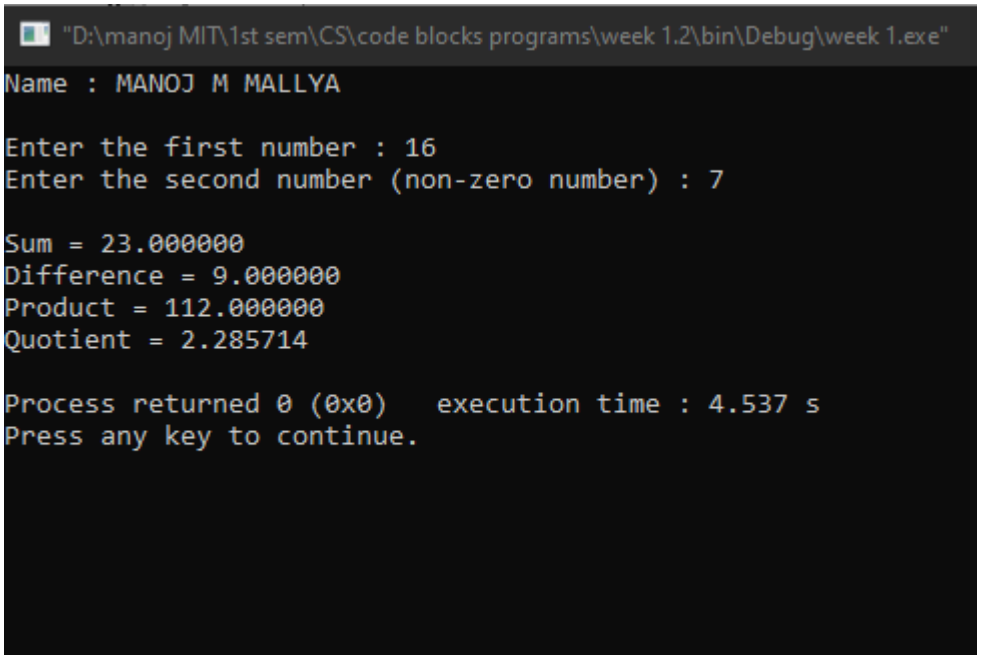


Q2. Write a C program to find the sum, difference, product and quotient of 2 numbers.

## Program:

```
/* Finding the sum, difference, product and quotient of 2 numbers */

#include <stdio.h>

#include <stdlib.h>


int main()

{

   printf("Name : MANOJ M MALLYA\n\n");

   double a,b;

   double sum,difference,product,quotient;

   printf("Enter the first number : ");

   scanf("%lf",&a);

   printf("Enter the second number (non-zero number) : ");

   scanf("%lf",&b);

   sum = a + b;

   difference = a - b;

   product = a * b;

   quotient = a / b ;

   printf("\nSum = %lf \nDifference = %lf \nProduct = %lf \nQuotient =
%lf\n",sum,difference,product,quotient);

   return 0;

}
```

**Output:**

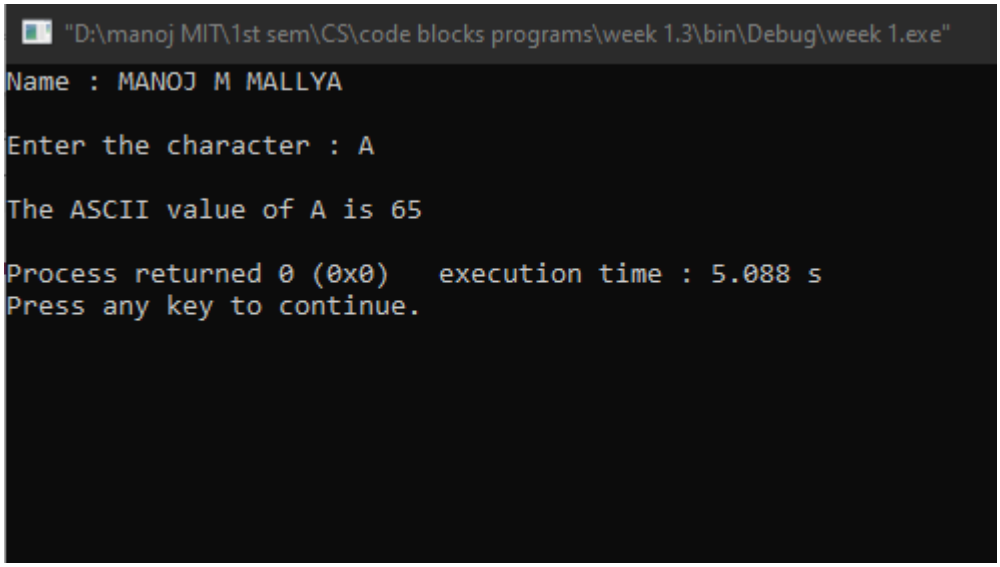



Q3. Write a C program to print the ASCII value of a character.

**Program:**

```
/* Printing the ASCII value of a character */
#include <stdio.h>
#include <stdlib.h>
int main()
{
   printf("Name : MANOJ M MALLYA\n\n");
   char letter;
   printf("Enter the character : ");
   scanf("%c",&letter);
   printf("\nThe ASCII value of %c is %d\n",letter,letter);
   return 0;
}
```

**Output:**



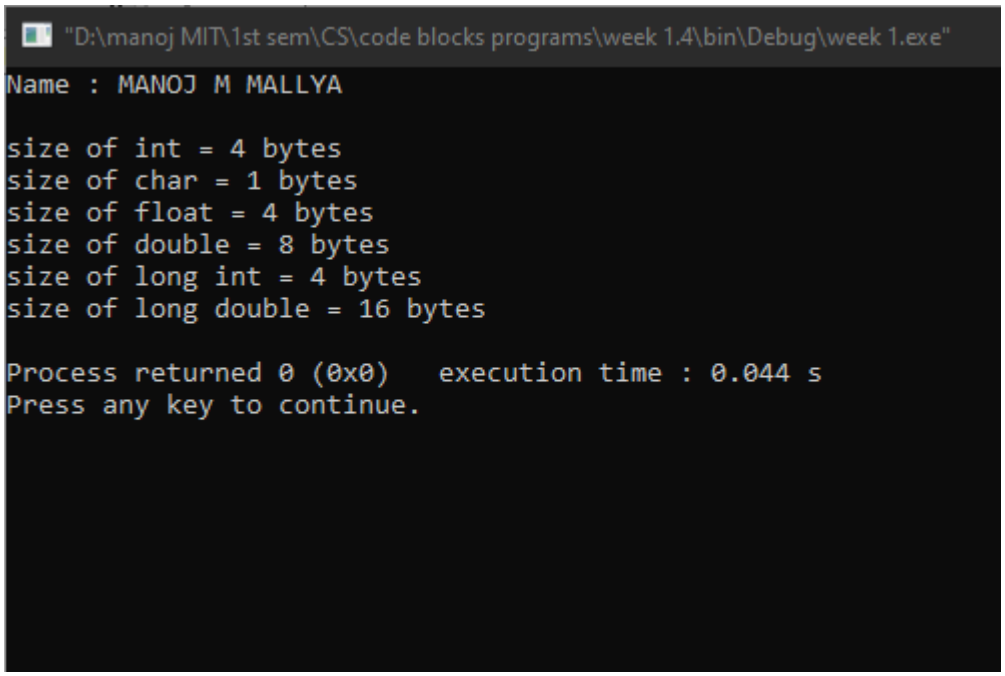

Q4. Write a C program to display the size of the data type int, char, float, double, long int and long double using size of ( ) operator.

**Program:**

```
/* Getting the size of different data types */
#include <stdio.h>
#include <stdlib.h>

int main()
{
   printf("Name : MANOJ M MALLYA\n\n");

   printf("size of int = %d bytes\n",sizeof(int));
   printf("size of char = %d bytes\n",sizeof(char));
   printf("size of float = %d bytes\n",sizeof(float));
   printf("size of double = %d bytes\n",sizeof(double));
```

```
    printf("size of long int = %d bytes\n",sizeof(long int));
    printf("size of long double = %d bytes\n",sizeof(long double));

    return 0;
}
```

**Output:**



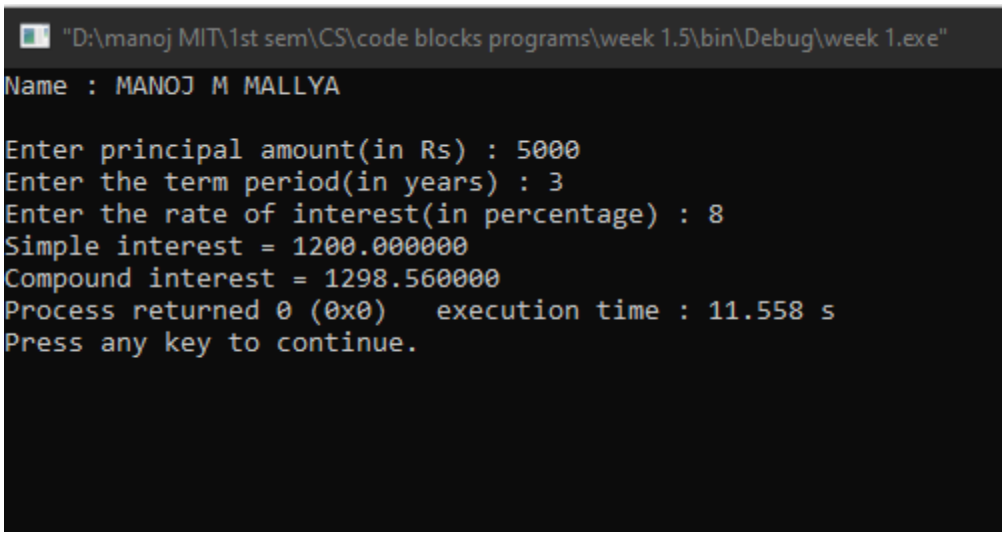

Q5. Input P, N and R to compute simple and compound interest.
[Hint: SI = PNR/100, CI = P(1+R/100)N -P]

**Program:**

```
/* computing simple and compound interest */
#include <stdio.h>
#include <stdlib.h>
#include <math.h>
```

```
int main()
{
    printf("Name : MANOJ M MALLYA\n\n");
    double principal,time,rate,simple_interest,compound_interest;
    printf("Enter principal amount(in Rs) : ");
    scanf("%lf",&principal);
    printf("Enter the term period(in years) : ");
    scanf("%lf",&time);
    printf("Enter the rate of interest(in percentage) : ");
    scanf("%lf",&rate);
    // computation
    simple_interest = (principal*time*rate)/100;
    compound_interest = principal*pow((1+rate/100),time) - principal;
    printf("Simple interest = %lf \nCompound interest = %lf
",simple_interest,compound_interest);
    return 0;
}
```

**Output:**

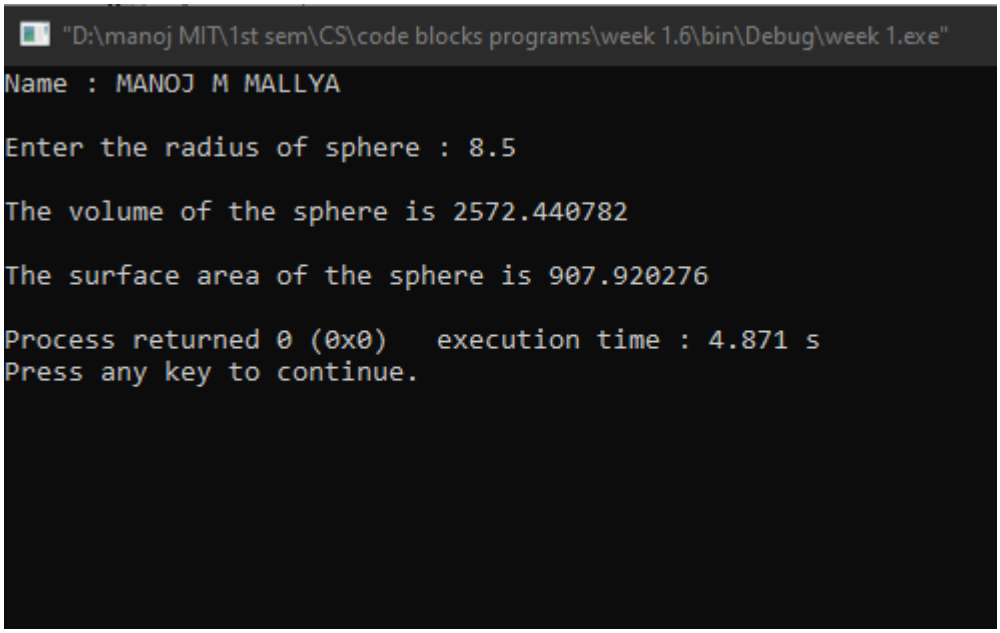


Q6. Input radius to find the volume and surface area of a sphere.
[Hint: volume = (4πr3 )/3, Area=4πr2 ]

**Program:**

```
/* Finding volume and surface area of a sphere */
#include <stdio.h>
#include <stdlib.h>
#define PI 3.14159265 //defining the value of irrational constant π (pi)

int main()
{
   printf("Name : MANOJ M MALLYA\n\n");

   double radius,volume,surface_area;
   printf("Enter the radius of sphere : ");
   scanf("%lf",&radius);
   //computation
   volume = (4*PI*radius*radius*radius)/3;
   surface_area = 4*PI*radius*radius;

   printf("\nThe volume of the sphere is %lf\n",volume);
   printf("\nThe surface area of the sphere is %lf\n",surface_area);

   return 0;
}
```

**Output:**



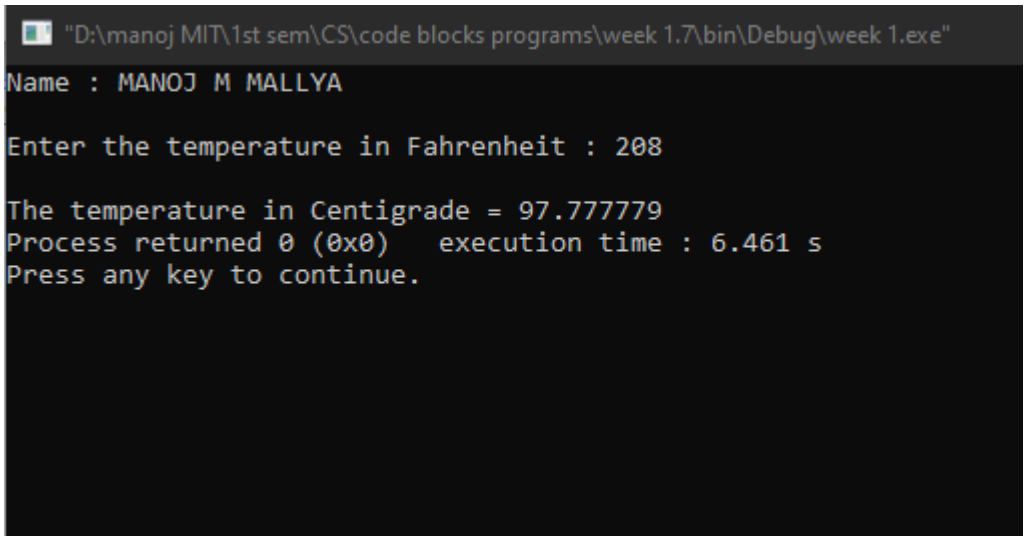

Q7. Convert the given temperature in Fahrenheit to Centigrade. [Hint: C=5/9(F-32)]

**Program:**

```
/* Conversion from Fahrenheit to Centigrade */
#include <stdio.h>
#include <stdlib.h>

int main()
{
   printf("Name : MANOJ M MALLYA\n\n");

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

```
    //conversion
    centigrade = 5*(fahrenheit-32)/9;

    printf("\nThe temperature in Centigrade = %f ",centigrade);
    return 0;
}
```

**Output:**



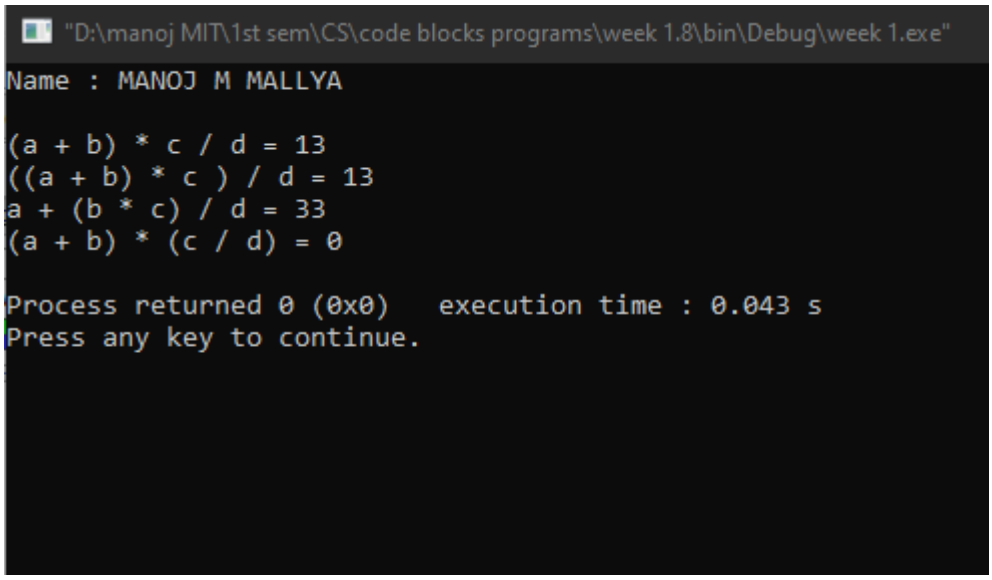

Q8. Write a C program to evaluate the following expression for the values a = 30, b=10, c=5, d=15. (i ) (a + b) * c / d (ii) ((a + b) * c) / d (iii) a + (b * c) / d (iv) (a + b) * (c / d)

**Program:**

```
/* Evaluation */
#include <stdio.h>
#include <stdlib.h>
```

```
int main()
{
    printf("Name : MANOJ M MALLYA\n\n");


    int a=30,b=10,c=5,d=15;
    printf("(a + b) * c / d = %d \n((a + b) * c ) / d = %d \na + (b * c) / d = %d \n(a + b) * (c / d) = %d\n",(a + b)*c/d, ((a + b)*c)/d, a+ (b*c)/d, (a + b)*(c/d));
    return 0;
}
```

**Output:**




**********

# Lab no: 2 – BRANCHING CONTROLSTRUCTURES

Write C programs to do the following:

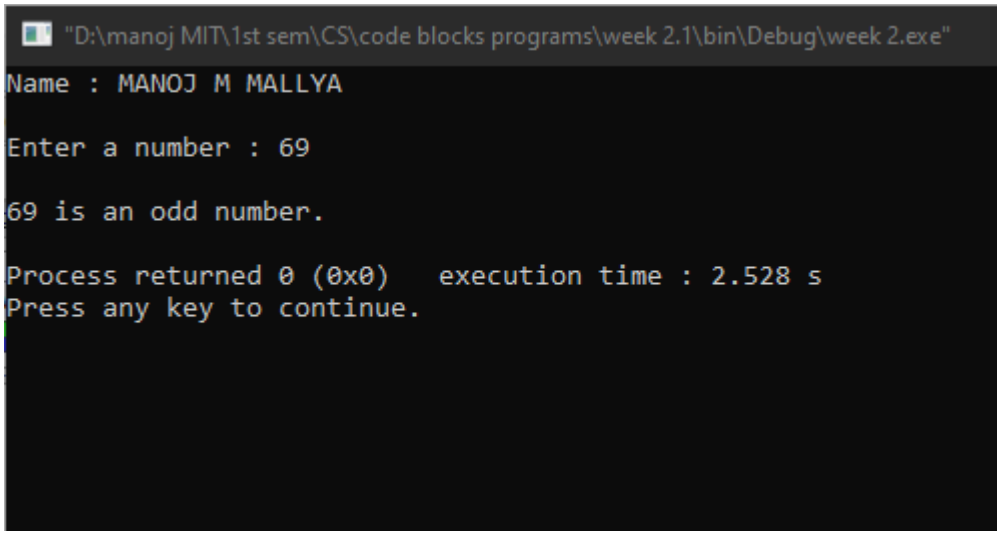
Q1. Check whether the given number is odd or even.

**Program:**

```
/* checking whether a number is odd or even */
#include <stdio.h>
#include <stdlib.h>

int main()
{
   printf("Name : MANOJ M MALLYA\n\n");
   int n;
   printf("Enter a number : ");
   scanf("%d",&n);

   //checking remainder when divided by 2
   if (n%2==1)
   {
      printf("\n%d is an odd number.\n",n);
   }
   else
   {
```

```
        printf("\n%d is an even number.\n",n);
    }
    return 0;
}
```

**Output:**




Q2. Find the largest among given 3 numbers.

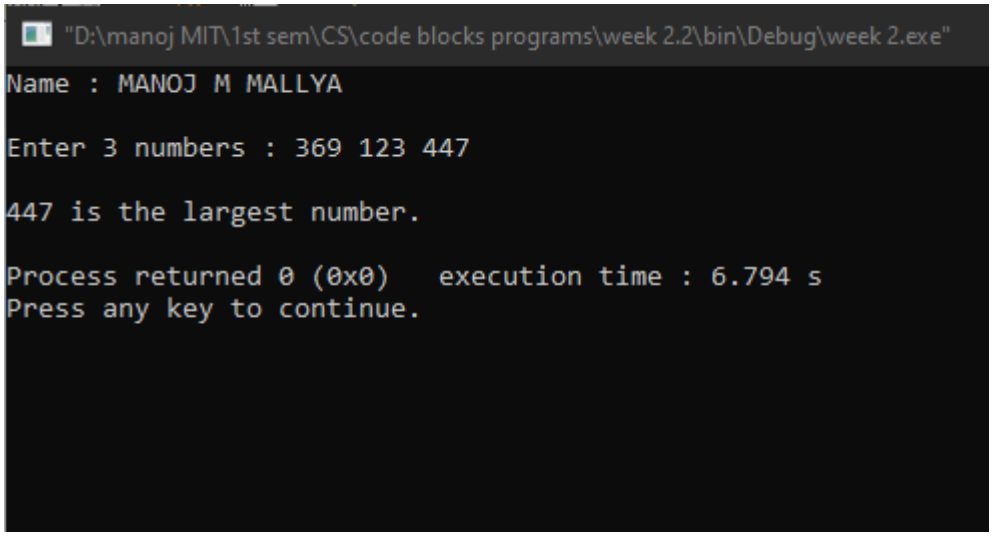
**Program:**

```
/* finding the largest number */
#include <stdio.h>
#include <stdlib.h>

int main()
{
    printf("Name : MANOJ M MALLYA\n\n");
    int a,b,c;
```

```
printf("Enter 3 numbers : ");
scanf("%d %d %d",&a,&b,&c);

if (a>b)
{
   if (a>c)
   {
      printf("\n%d is the largest number.\n",a);
   }
   else
   {
      printf("\n%d is the largest number.\n",c);
   }
}
else
{
   if (b>c)
   {
      printf("\n%d is the largest number.\n",b);
   }
   else
   {
      printf("\n%d is the largest number.\n",c);
   }
}
```

```
    return 0;
}
```

**Output:**



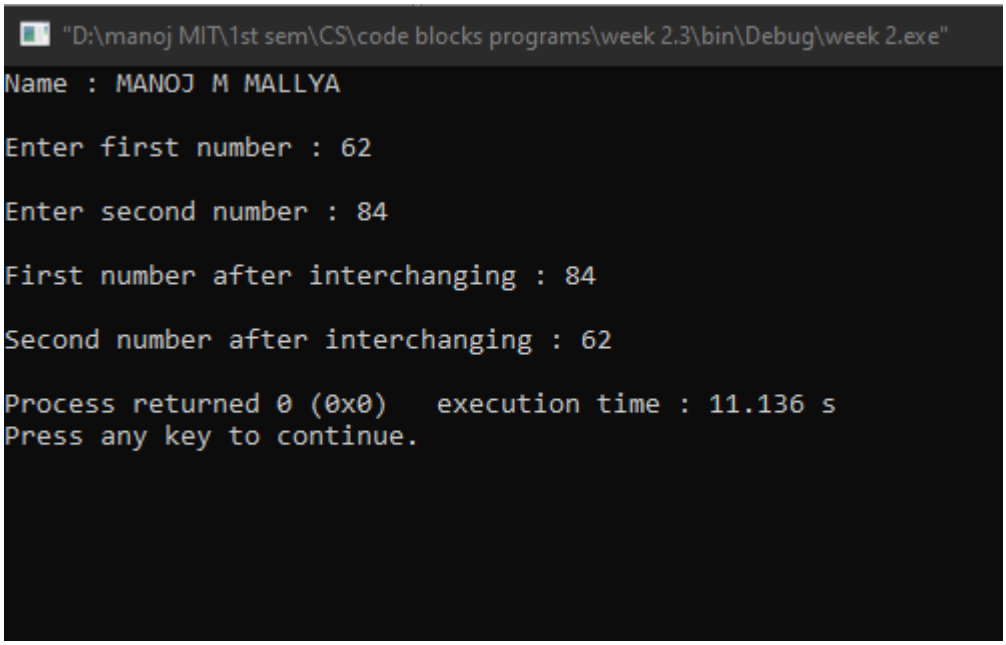

Q3. Swap two numbers without using third variable.

**Program:**

```
/* swapping two numbers witjout using 3rd variable */
#include <stdio.h>
#include <stdlib.h>

int main()
{
    printf("Name : MANOJ M MALLYA\n\n");
    int a,b;
    printf("Enter first number : ");
    scanf("%d",&a);
```

```
    printf("\nEnter second number : ");
    scanf("%d",&b);

    a=a+b;// a becomes (a+b)
    b=a-b;//b becomes a
    a=a-b;//a becomes b

    printf("\nFirst number after interchanging : %d\n",a);
    printf("\nSecond number after interchanging : %d\n",b);
    return 0;
}
```

**Output:**



Q4. Compute all the roots of a quadratic equation using switch case statement. [Hint: x = (-b +/- sqrt(b2 -4ac))/2a]

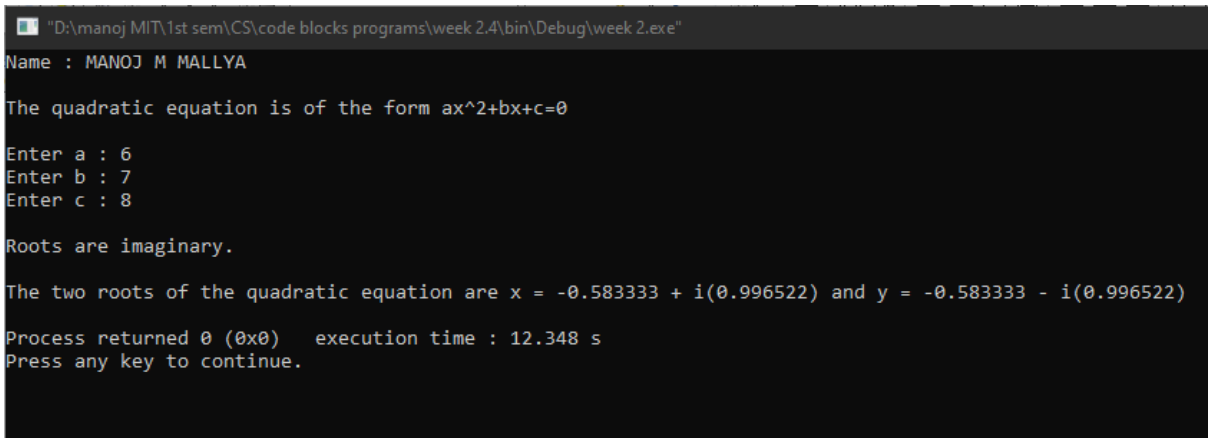
## **Program:**

```
/* getting the roots of a quadratic equation */

#include <stdio.h>

#include <stdlib.h>

#include <math.h>


int main()

{

   printf("Name : MANOJ M MALLYA\n\n");

   double a,b,c,x,y,real,imaginary;

   printf("The quadratic equation is of the form ax^2+bx+c=0\n\n");// standard form of a quadratic equation


   printf("Enter a : ");

   scanf("%lf",&a);


   printf("Enter b : ");

   scanf("%lf",&b);


   printf("Enter c : ");

   scanf("%lf",&c);


   double disc = (b*b)-(4*a*c);//disc - discriminant

   int k;


   if(a!=0)
```

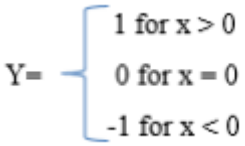
```
{
    if (disc > 0)
    {
        k=1;
    }
    if (disc == 0)
    {
        k=2;
    }
    if (disc < 0)
    {
        k=3;
    }

    switch (k)
    {
    case 1:
        printf("\nRoots are real and distinct.\n");
        x = ((-b) + sqrt((b*b) - (4*a*c)))/(2*a);//1st root
        y = ((-b) - sqrt((b*b) - (4*a*c)))/(2*a);//2nd root
        printf("\nThe two roots of the quadratic equation are x = %lf and y =
%lf\n",x,y);
        break;

    case 2:
        printf("\nRoots are real & equal.\n");
        x = -b / (2*a);
```

```
        printf("\nThe two roots of the quadratic equation are %lf and
%lf\n",x,x);
        break;


    case 3:
        printf("\nRoots are imaginary.\n");
            real = -b / (2*a) ;
            imaginary = (sqrt (-1*disc)) / (2*a);
            printf("\nThe two roots of the quadratic equation are x = %f + i(%f)
and y = %f - i(%f)\n",real,imaginary,real,imaginary);
    }
  }


  else
  {
    printf("\nIts a linear equation.\n");// as the co-efficient of 'a' is zero.
  }
  return 0;
}
```

## Output:



Q5. Write a program that will read the value of x and evaluate the following function



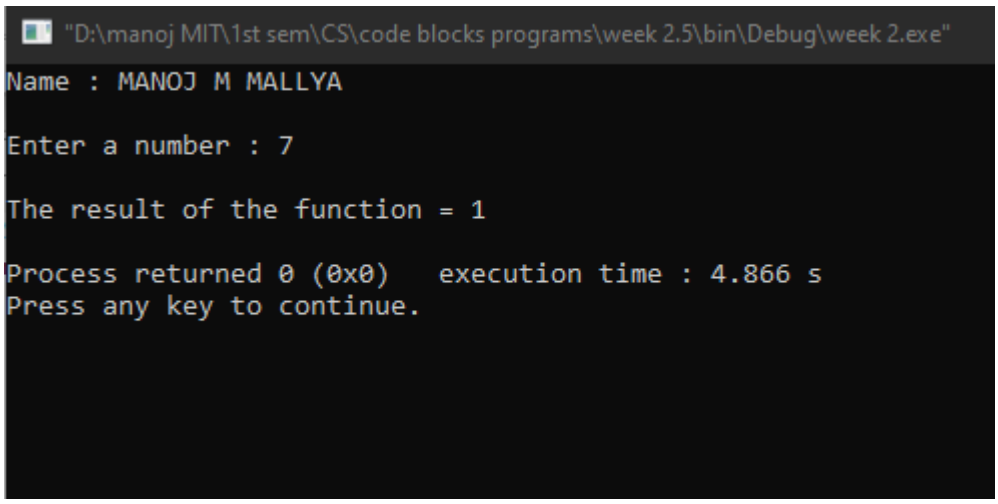

Use else if statements & Print the result (‘Y’ value).

**Program:**

```
/* signum function */
#include <stdio.h>
#include <stdlib.h>

int main()
{
   printf("Name : MANOJ M MALLYA\n\n");
   int n,result;
   printf("Enter a number : ");
   scanf("%d",&n);

   if (n>0)
   {
      result = 1;//when the number is greater than zero
   }
   else if (n<0)
   {
      result = -1;//when the number is less than zero
```

```
    }
    else
    {
        result = 0;//when the number is equal to zero
    }

    printf("\nThe result of the function = %d\n",result);
        return 0;
}
```

**Output:**



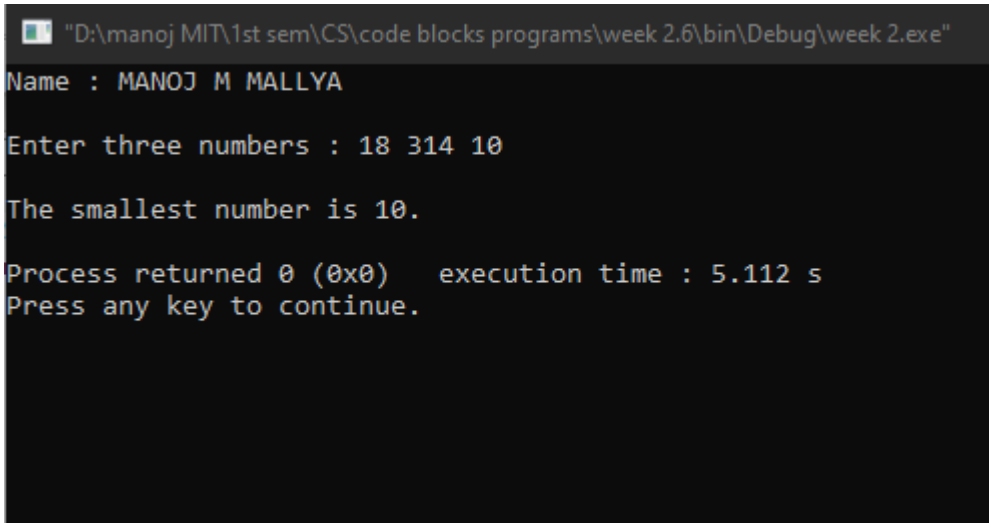

Q6. Find the smallest among three numbers using conditional operator.

**Program:**

```
/* finding the smallest of 3 numbers using conditional operator */
#include <stdio.h>
#include <stdlib.h>
```

```
int main()
{
    printf("Name : MANOJ M MALLYA\n\n");
    int a,b,c,small;
    printf("Enter three numbers : ");//getting the 3 numbers
    scanf("%d %d %d",&a,&b,&c);

    small = (a < b)? ((a < c)? a : c ) : ((b < c)? b : c);//getting the smallest number
    printf("\nThe smallest number is %d\n",small);//printing the smallest number
    return 0;
}
```

**Output:**




**********