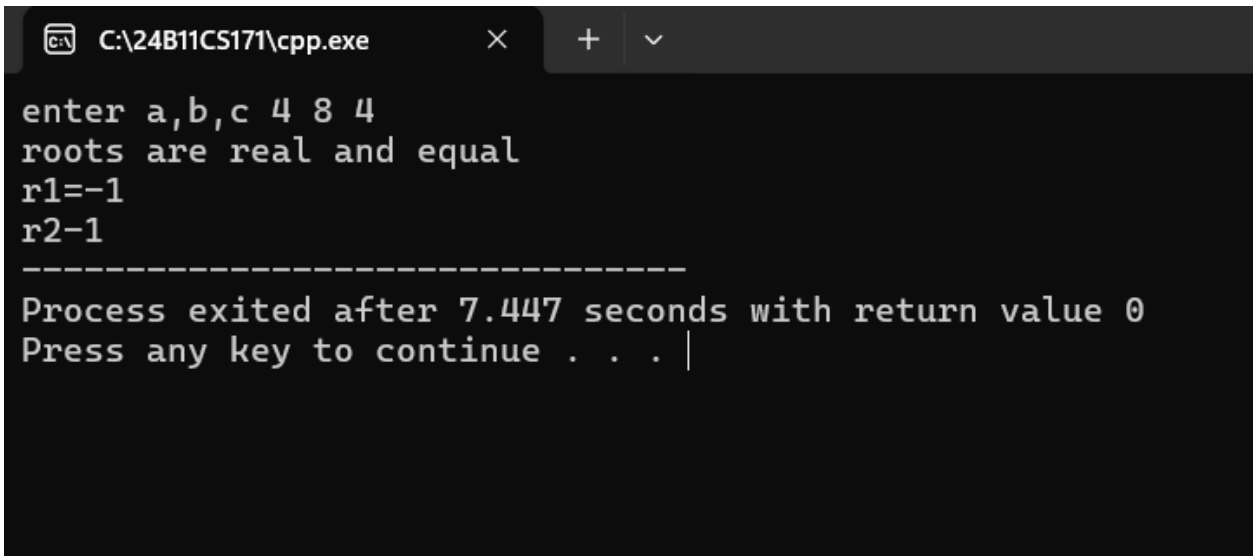
AIM: Write a C++ program to find the roots of a quadratic equation.

PROGRAM:

```
#include<iostream>
#include<cmath>
using namespace std;
int main()
{
double a,b,c,d,r1,r2;  // Variable declarations
cout<<"enter a,b,c";
cin>>a>>b>>c;  // Input coefficients
d=(b*b)-(4*a*c);  // Calculate discriminant
// Check nature of roots based on discriminant
if(d==0)
{           // Case 1: Discriminant = 0 → roots are real and equal
            cout<<"roots are real and equal"<<endl;
          r1=-b/(2*a);
          r2=-b/(2*a);
          cout<<"r1="<<r1<<endl<<"r2"<<r2;
}
else if(d>0)
{         // Case 2: Discriminant > 0 → roots are real and distinct
          cout<<"roots are real and distinct"<<endl;
          r1=(-b+sqrt(d))/(2*a);
          r2=(-b-sqrt(d))/(2*a);
          cout<<"r1="<<r1<<endl<<"r2="<<r2;
}
else
{         // Case 3: Discriminant < 0 → roots are imaginary (no real solution)
          cout<<"roots are imaginary";
```

```
}
 return 0;
}
```

OUTPUT:

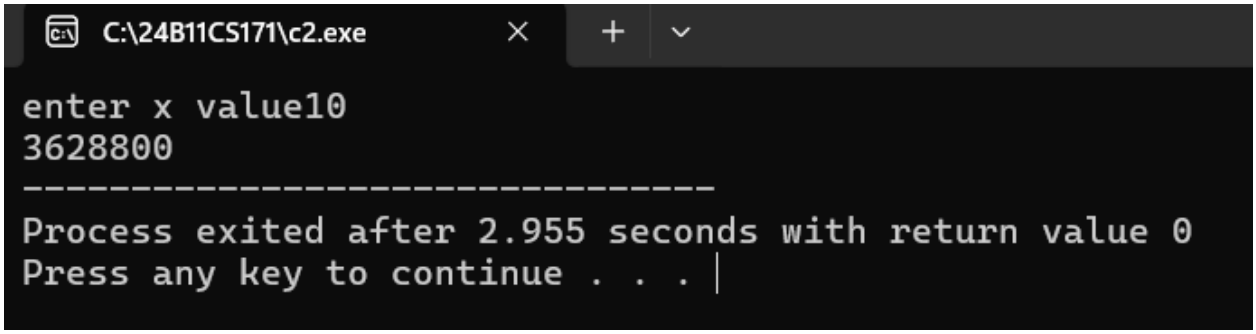


AIM: Write a C++ program to find factorial of a given number using recursion.

PROGRAM:

```
#include<iostream>
using namespace std;
int factorial(int n) // Function to calculate factorial using recursion
{       // Base case: factorial of 1 is 1
        if(n==1)
        return 1;
        else
        return(n*factorial(n-1)); // Recursive case: n! = n * (n-1)!
}
int main()
{ int x; // Variable to store user input number
cout<<"enter x value";
cin>>x;
cout<<factorial(x);//printing value by calling fuction
return 0;
}
```

OUTPUT:

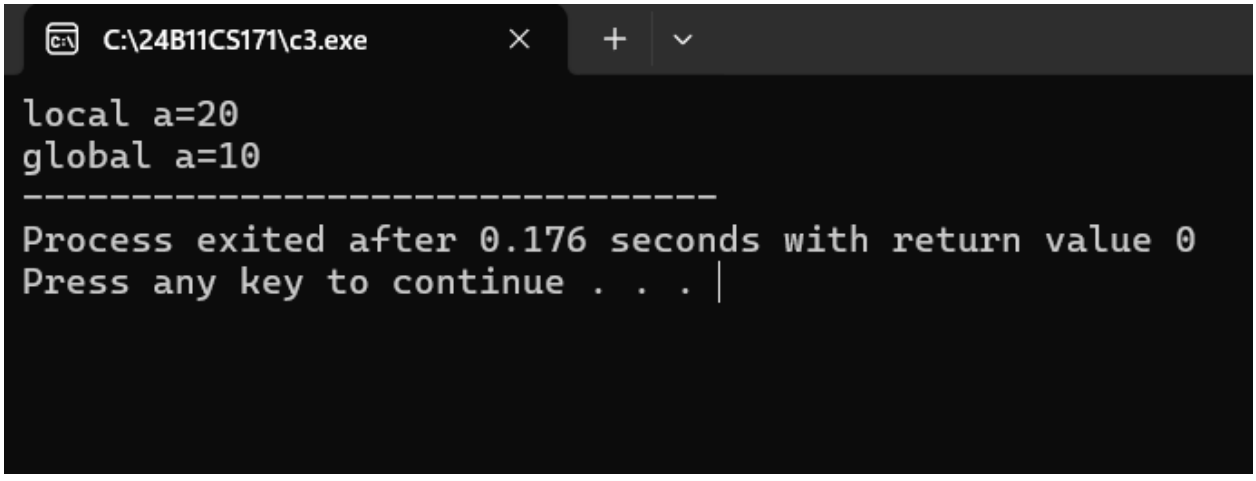


AIM: Write a C++ program to implement scope resolution and namespaces.

PROGRAM:

```
#include<iostream>
using namespace std;
int a=10;//global variable
int main()
{
	int a=20;//local variable
	cout<<"local a="<<a<<endl;//printing local variable
	cout<<"global a="<<::a;//printing global variable
	return 0;
}
```

OUTPUT:

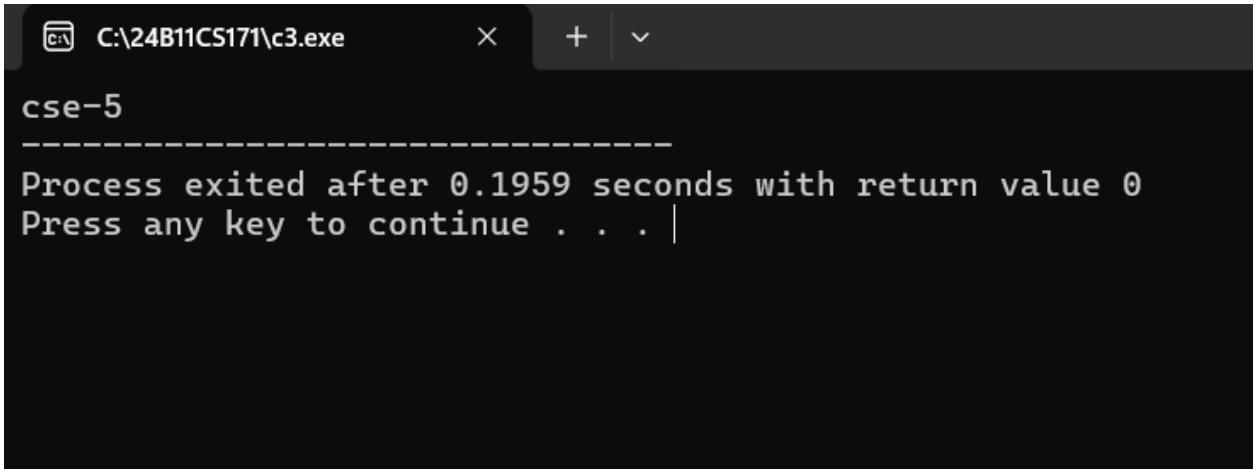


AIM: Write a C++ program to implement scope resolution and namespaces.

PROGRAM:

```
#include<iostream>
using namespace std;
// first name space
namespace one
{
	void display()
	{
		int a=5;
		cout<<a;
	}
}
// second name space
namespace two
{
	void display()
	{
		string m="cse-";
		cout<<m;
	}
}
int main()
{
	two::display();// accessing variable from second name space.
	 one::display();// accessing variable from first name space.
	 return 0;
}
```

OUTPUT:


C:\24B11CS171\c3.exe
cse-5

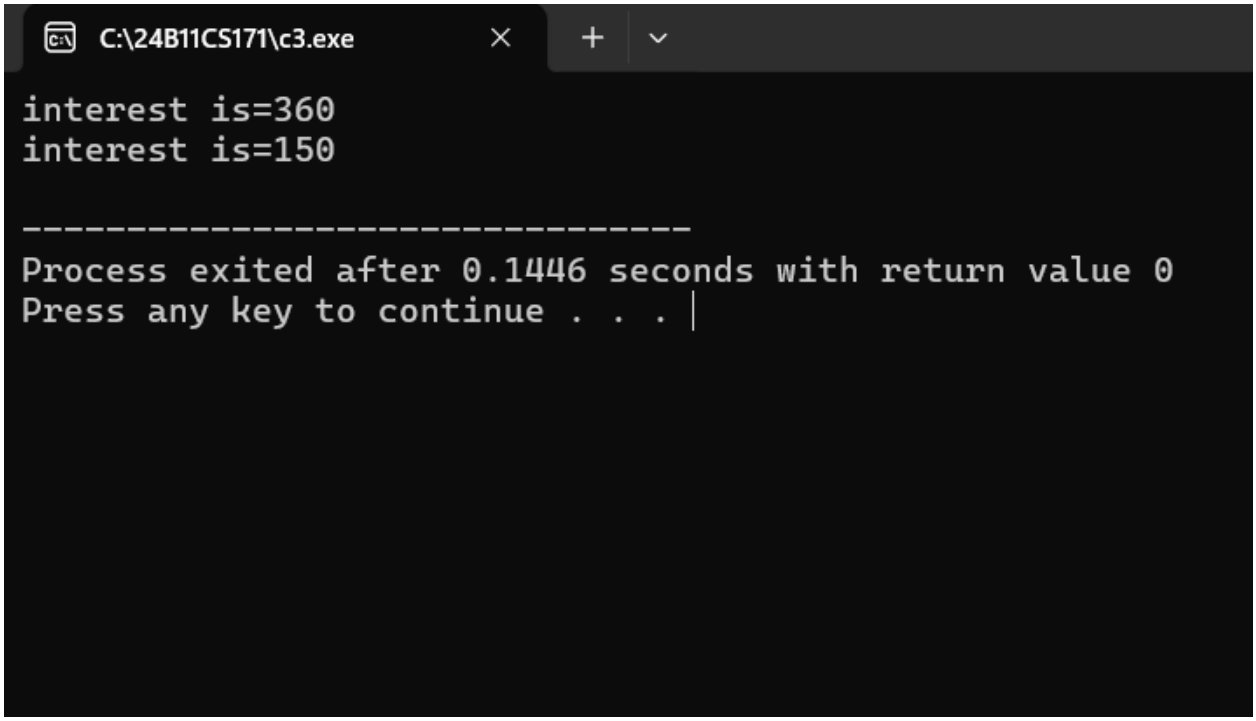
Process exited after 0.1959 seconds with return value 0
Press any key to continue . . .

AIM: Write a C++ program to illustrate the use of default arguments and access specifiers

PROGRAM:

```
#include<iostream>
using namespace std;
// Function to calculate Simple Interest
// Default arguments: p=1000, t=5, r=3
// Formula: (p * t * r) / 100
void SI(int p=1000,int t=5,float r=3)
{
	cout<<"interest is="<<(p*t*r)/100<<endl;
}
int main()
{
	SI(3000,4);//function call with only 2 arguments
	SI();//function call with no arguments
	return 0;
}
```

OUTPUT:


C:\24B11CS171\c3.exe
interest is=360
interest is=150

Process exited after 0.1446 seconds with return value 0
Press any key to continue . . .

AIM: Write a C++ program to illustrate the use of default arguments and access specifiers.

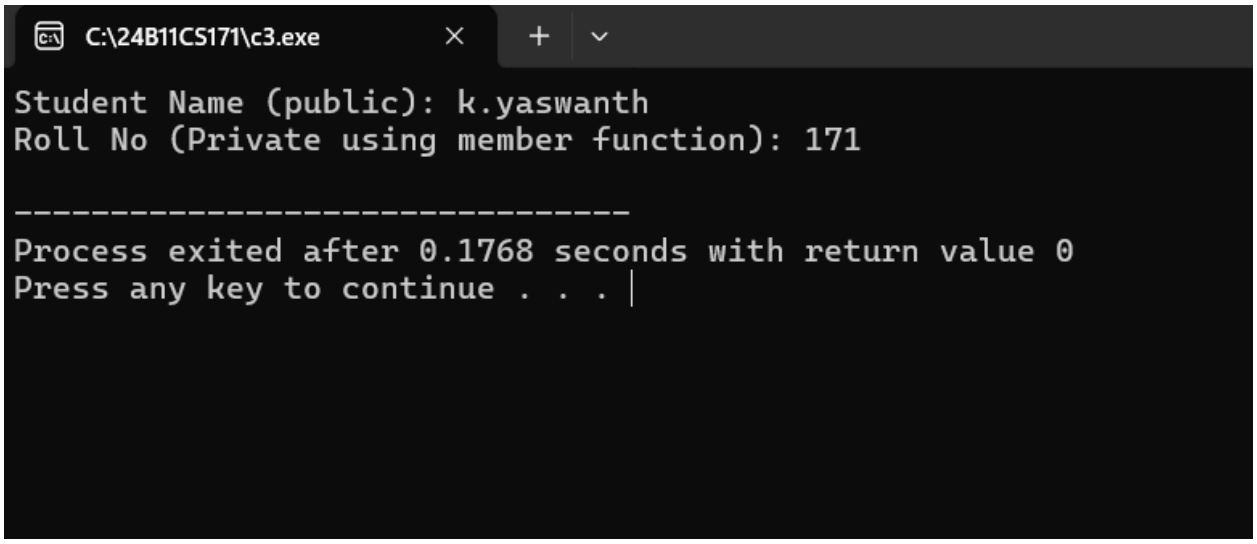
PROGRAM:

```
#include <iostream>
using namespace std;
// Define a class named Sample
class Sample {
private:
    int rollNo;   // Private data member
public:
    string name;  // Public data member
   // Parameterized constructor
  // Used to initialize 'name' and 'rollNo' when object is created
    Sample(string n, int r) {
        name = n; // Assign parameter n to member 'name'
        rollNo = r; // Assign parameter r to member 'rollNo'
    }
// Member function to display roll number
    void show() {
        cout << "Roll No (Private using member function): " << rollNo << endl;
    }
};
int main() {
// Create object 's' of class Sample and initialize it using constructor
    Sample s("k.yaswanth", 171);
// Accessing public data member directly
    cout << "Student Name (public): " << s.name << endl;


    s.show();
    return 0;
```

}

OUTPUT:


C:\24B11CS171\c3.exe
Student Name (public): k.yaswanth
Roll No (Private using member function): 171

Process exited after 0.1768 seconds with return value 0
Press any key to continue . . .