Experiment No-06: Friend Function and Friend Class in C++.

Objectives

- Familiarize with friend class and function in C++.

- Solve some problems using the friend function.

Example 1: A C++ program to demonstrate the friend function.

```cpp
// C++ program to demonstrate the working of friend function

#include <iostream>
using namespace std;

class Distance {
    private:
        int meter;
        int value;

        // friend function
        friend int addvalue(Distance);

    public:
        // another way of declaring constructor
        //Distance() : meter(0) {}
        // default constructor
        Distance(){
            meter = 0;
        }

};

// friend function definition
int addvalue(Distance d) {
    cout<<"Enter the value you want to add: ";
    //accessing private members from the friend function
    cin>>d.value;
    return d.meter+d.value;
}

int main() {
    Distance D;
    cout << "Distance: " << addvalue(D);
    return 0;
}
```

(handwritten annotations:) friend function private member k access korte pare, outside the class.

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Scope:
1.Block scope
2.Method Scope
3.Program Scope

Example 2: Add members of two different classes using friend functions.

```cpp
#include <iostream>
using namespace std;

// forward declaration
class Class2;

class Class1 {

    private:
        int num1;

    public:
        // constructor to initialize num1 to 15
        Class1(){
            num1 = 15;
        }

         // friend function declaration
         friend int add(Class1, Class2);
};

class Class2 {

    private:
        int num2;

    public:
        // constructor to initialize num2 to 1
        Class2(){
            num2 = 1;
        }
        // friend function declaration
        friend int add(Class1, Class2);
};

// access members of both classes
int add(Class1 object1, Class2 object2) {
    return (object1.num1 + object2.num2);
}

int main() {
    Class1 object1;
    Class2 object2;
    cout << "Sum: " << add(object1,object2);
    return 0;
}
```

Example : A C++ program to demonstrate the working of friend class.

```cpp
#include <iostream>
using namespace std;

// forward declaration
class ClassB;

class ClassA {
    private:
        int numA;

        // friend class declaration
        friend class ClassB;

    public:
        // constructor to initialize numA to 16
        ClassA(){
            numA = 16;
        }
};

class ClassB {
    private:
        int numB;

    public:
        // constructor to initialize numB to 4
        ClassB(){
            numB = 4;
        }

    // member function to add numA
    // from ClassA and numB from ClassB
    int add() {
        ClassA objectA;
        return objectA.numA + numB;
    }
};

int main() {
    ClassB objectB;
    cout << "Sum: " << objectB.add();
    return 0;
}
```

*** For better understanding please feel free to search on internet because it is the best source of learning. ***

<u>Practice Exercise</u>

1. Write a C++ Program to display the reverse of a number using the Friend function.

2. Write a C++ program to find the number and sum of all integer between 100 and 200 which are divisible by 11 with friend function.

3. Write a program in C++ to Check Whether a Number can be expressed as Sum of Two Prime Numbers using the friend function.

[Resource Link 1]
[Resource Link 2]