



Sir Syed CASE
Institute of Technology

OOP Lab #6
Friend Classes

SUBMITTED BY:

UBAID AHMAD

ROLL NO:

2410-0011

SUBMITTED TO:

Mam Laiba Tanveer

DATE:

28/10/2025

Example 1 Friend Function

Code:

```
#include <iostream>

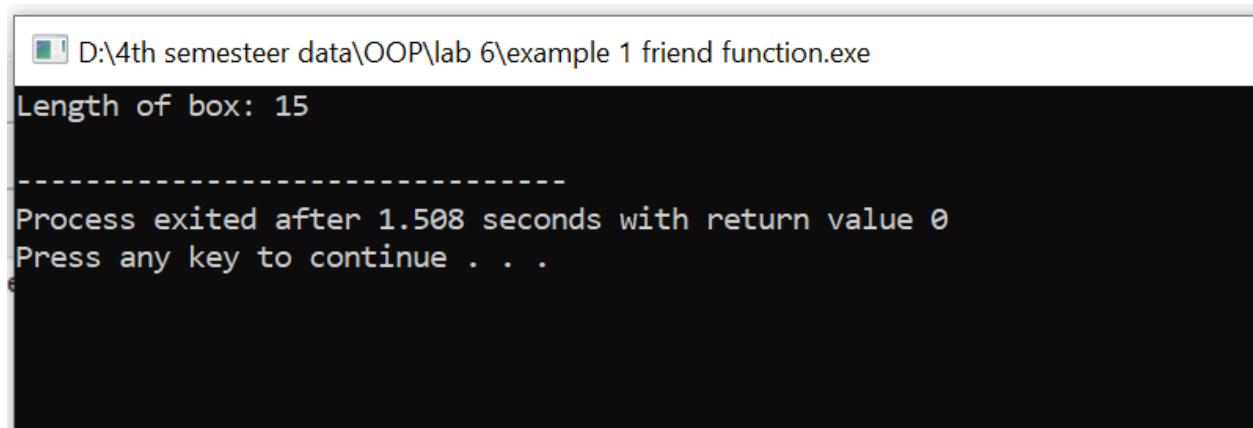
using namespace std;

class Box {
private:
    int length;
public:
    Box(int l) {
        length = l;
    }
    // Declaration only (not definition)
    friend void showLength(Box b);
};

// Definition outside the class
void showLength(Box b) {
    cout<<"Length of box: "<< b.length <<endl;
}

int main() {
    Box box1(15);
    showLength(box1); // friend function accessing private data
    return 0;
}
```

Output:



```
D:\4th semester data\OOP\lab 6\example 1 friend function.exe
Length of box: 15
-----
Process exited after 1.508 seconds with return value 0
Press any key to continue . . .
```

Example 2 Friend Function

Code:

```
#include <iostream>
using namespace std;
class B;

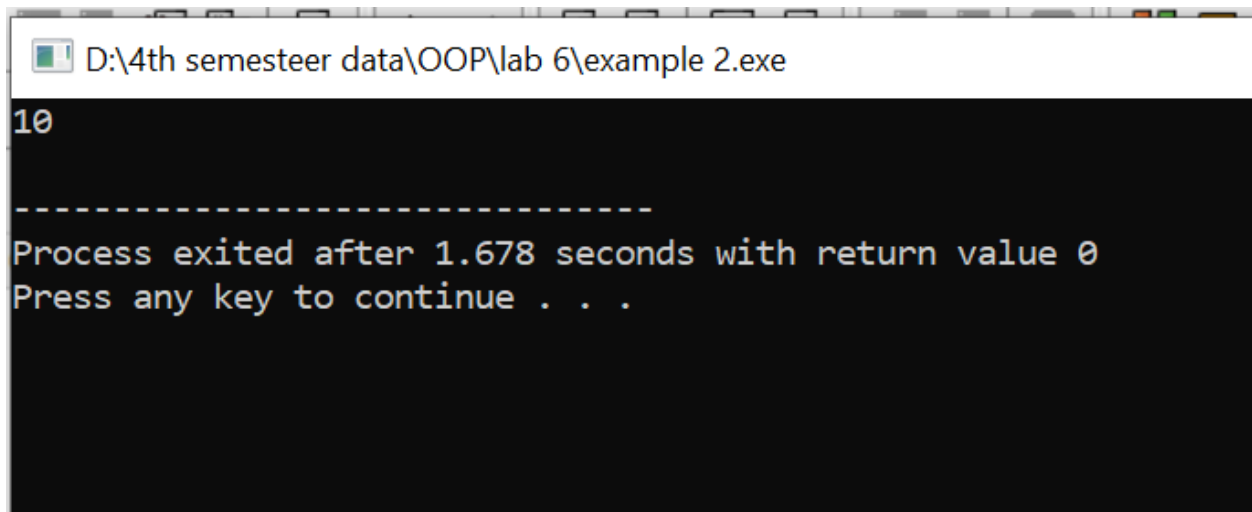
class A
{
    int x;
    public:
    void setdata(int i)
    {
        x = i;
    }
    friend void min(A, B);
};

class B
```

```
{
    int y;
    public:
    void setdata(int i)
    {
        y = i;
    }
    friend void min(A, B);
};

void min(A a, B b)
{
    if(a.x <= b.y)
        cout << a.x << endl;
    else
        cout << b.y << endl;
}

int main()
{
    A a;
    B b;
    a.setdata(10); // Set x = 10
    b.setdata(20); // Set y = 20
    min(a, b); //friend function call
    return 0;
}
```



The screenshot shows a Windows command prompt window with the title bar 'D:\4th semesteer data\OOP\lab 6\example 2.exe'. The command prompt displays the output '10', followed by a dashed line '-----', and then the message 'Process exited after 1.678 seconds with return value 0' and 'Press any key to continue . . .'. The text is in a monospaced font on a black background.

Example 3 Friend Class

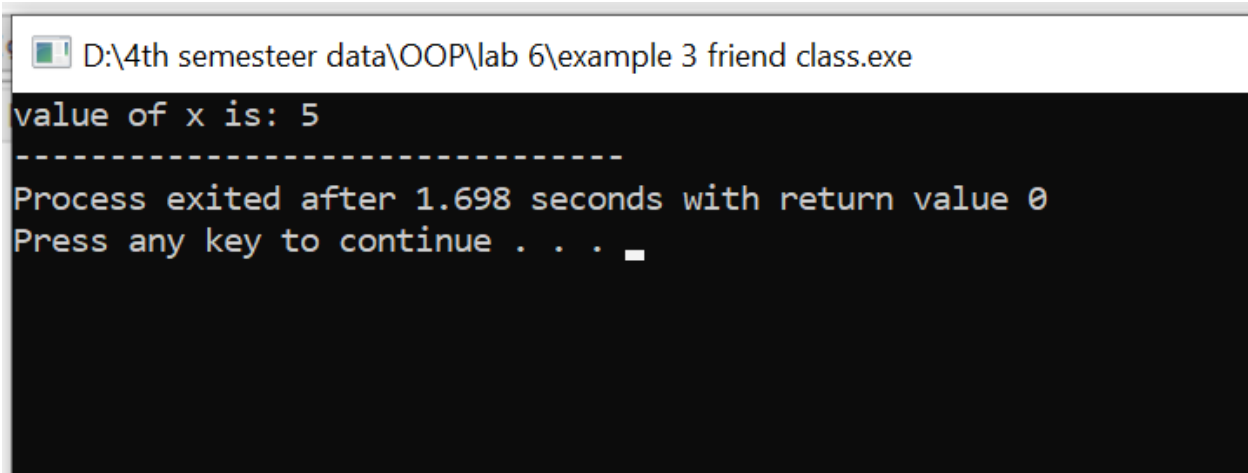
Code:

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

class A {
    int x = 5;
    friend class B; // friend class
};

class B {
public:
    void display(A &a) { //we need the actual object reference not a copy here
        cout << "value of x is: " << a.x;
    }
};
```

```
int main() {
    A a;
    B b;
    b.display(a);
    return 0;
}
```



```
D:\4th semesteeer data\OOP\lab 6\example 3 friend class.exe
value of x is: 5
-----
Process exited after 1.698 seconds with return value 0
Press any key to continue . . .
```

Task 1 Friend fun Compare area

Code:

```
#include <iostream>
using namespace std;
class Circle;
class Rectangle{
    double area;
    public:
    Rectangle(double a){
        area=a;
    }
    //friend class
```

```
friend void compareArea(Rectangle r,Circle c);

};

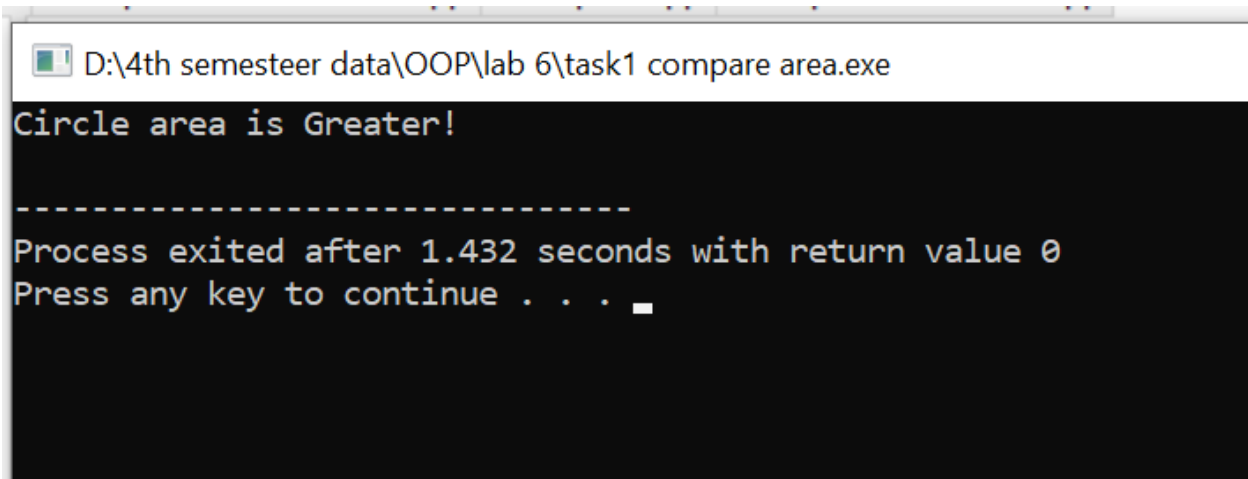
class Circle{
    double area;
    public:
        Circle(double a){
            area=a;
        }

        friend void compareArea(Rectangle r,Circle c);
};

void compareArea(Rectangle r,Circle c){
    if(r.area>c.area){
        cout<<"Rectangle area is greater!"<<endl;
    }
    else if(r.area<c.area)
    {
        cout<<"Circle area is Greater!"<<endl;
    }else{
        cout<<"Both have same area!"<<endl;
    }
}

int main(){
    Rectangle r(20);
    Circle c(30);
    compareArea(r,c);
}
```

```
    return 0;  
}
```



```
D:\4th semesteeer data\OOP\lab 6\task1 compare area.exe  
Circle area is Greater!  
-----  
Process exited after 1.432 seconds with return value 0  
Press any key to continue . . .
```

Task 2 Friend Class

Code:

```
#include <iostream>  
using namespace std;  
  
class Car{  
    private:  
        int horsepower;  
    public:  
        Car(int value){  
            horsepower=value;  
        }  
  
        friend class Engine;  
};
```

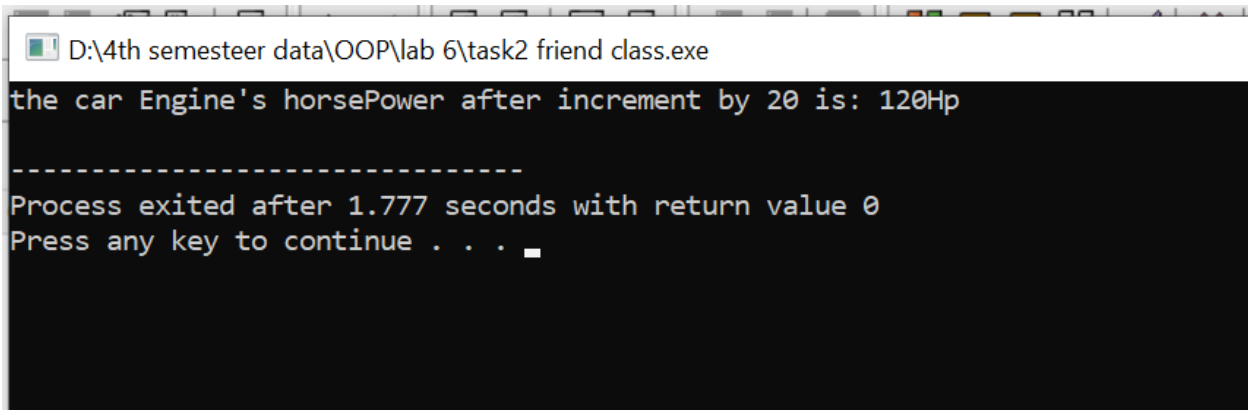


```

class Engine{
    public:
        int incrementHP(Car &c){
            c.horsepower+=20;
            return c.horsepower;
        }
};

int main(){
    Car c(100);
    Engine e;
    int newHp=e.incrementHP(c);
    cout<<"the car Engine's horsePower after increment by 20 is:
"<<newHp<<"Hp"<<endl;
    return 0;
}

```



```

D:\4th semesteeer data\OOP\lab 6\task2 friend class.exe
the car Engine's horsePower after increment by 20 is: 120Hp
-----
Process exited after 1.777 seconds with return value 0
Press any key to continue . . .

```

Task 3 friend function

Code:

```

#include <iostream>
using namespace std;
class Car{

```

```

        private:
            int horsepower;
        public:
            Car(int value){
                horsepower=value;
            }
        friend void incrementHP(Car &c,int val);
};

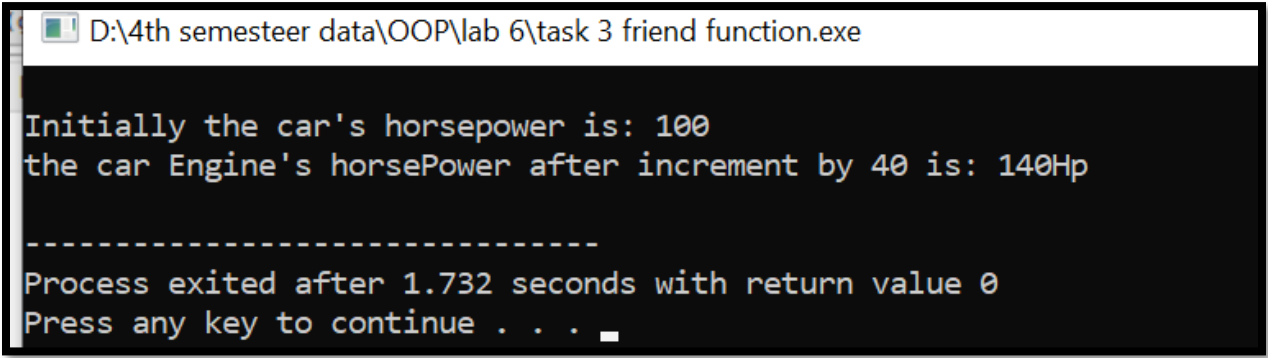
void incrementHP(Car &c,int val){
    cout<<"\nInitially the car's horsepower is:
        "<<c.horsepower<<endl;
    c.horsepower+=val;
    cout<<"the car Engine's horsePower after increment
        by "<<val<<" is: "<<c.horsepower<<"Hp"<<endl;
}

int main(){

    Car c(100);
    incrementHP(c,40);
    return 0;

}

```



```

D:\4th semesteeer data\OOP\lab 6\task 3 friend function.exe
Initially the car's horsepower is: 100
the car Engine's horsePower after increment by 40 is: 140Hp
-----
Process exited after 1.732 seconds with return value 0
Press any key to continue . . .

```

Task 4: 2dd array sum and transpose using friend class

Code:

```
#include <iostream>
using namespace std;
class Matrix{
    int arr1[3][3];
    int arr2[3][3];
public:
    Matrix(int a[3][3],int b[3][3]){
        for(int i=0;i<3;i++){
            for(int j=0;j<3;j++){
                arr1[i][j]=a[i][j];
                arr2[i][j]=b[i][j];
            }
        }
    }
    friend class Modify;
};
class Modify{
public:
    int arr3[3][3];
    void add(Matrix &m){
        for(int i=0;i<3;i++){
            for(int j=0;j<3;j++){
```

```

        arr3[i][j]=m.arr1[i][j]+m.arr2[i][j];
    }
}


void display(){
    for(int i=0;i<3;i++){
        for(int j=0;j<3;j++){
            cout<<arr3[i][j]<<" ";
        }
        cout<<endl;
    }

}

void transpose() {
    int newArr[3][3];
    for (int i = 0; i < 3; i++) {
        for (int j = 0; j < 3; j++) {
            newArr[i][j] = arr3[j][i];
        }
    }
    //now storing the result again in arr3
    for (int i = 0; i < 3; i++) {
        for (int j = 0; j < 3; j++) {
            arr3[i][j]=newArr[i][j];
        }
    }
}

```

```
};  
int main(){  
    int a[3][3]={1,2,3},{4,5,6},{7,8,9}};  
    int b[3][3]={11,12,13},{14,15,16},{17,18,19}};  
    Matrix m(a,b);  
    Modify x;  
    x.add(m);  
    cout<<"\nSum of two arrays is!\n"<<endl;  
    x.display();  
    x.transpose();  
    cout<<"\nAfter transpose!\n"<<endl;  
    x.display();  
    return 0;  
}
```



```
D:\4th semester data\OOP\lab 6\task4 2d array.exe  
  
Sum of two arrays is!  
12 14 16  
18 20 22  
24 26 28  
  
After transpose!  
12 18 24  
14 20 26  
16 22 28  
  
-----  
Process exited after 1.789 seconds with return value 0  
Press any key to continue . . .
```

END,,,
