# Third Year B. Tech (EL & CE)

**Semester: V Subject:** Object-Oriented Programming Lab

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**Roll No: 52 Batch: A3**

# Experiment No: 04

**Name of the Experiment**: **Bubble sort Algorithm**

**Performed on: 25/10/2023**

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**Problem Statement:**

Friend Function in C++

In C++ define a class Box consisting of the following

data members length, breadth and height member functions

1 one default constructor

2 Two overloaded operator member function '<<' and '>>'

to display and read box dimensions

3 One member function '+' to add two box objects and one friend function to compute the volume

and the box using operator overloading

**Output:**

//D:\Object Oriented Programming\exp4>cd "d:\Object Oriented Programming\exp4\" && g++ friend.c++ -o friend && "d:\Object Oriented Programming\exp4\"friend

Enter dimensions for Box 1:

Enter length: 10

Enter breadth: 20

Enter height: 30

Enter dimensions for Box 2:

Enter length: 50

Enter breadth: 60

Enter height: 70

Box 1: Length: 10 Breadth: 20 Height: 30

Box 2: Length: 50 Breadth: 60 Height: 70

Sum of Box 1 and Box 2: Length: 60 Breadth: 80 Height: 100

Volume of the sum of Box 1 and Box 2: 480000

**Code:**

#include <iostream>

class Box {

private:

    double length;

    double breadth;

    double height;

public:

    // Default constructor

    Box() : length(0.0), breadth(0.0), height(0.0) {}

    // Overloaded '<<' operator to display box dimensions

    friend std::ostream& operator<<(std::ostream& os, const Box& box) {

        os << "Length: " << box.length << " Breadth: " << box.breadth << " Height: " << box.height;

        return os;

    }

    // Overloaded '>>' operator to read box dimensions

    friend std::istream& operator>>(std::istream& is, Box& box) {

        std::cout << "Enter length: ";

        is >> box.length;

        std::cout << "Enter breadth: ";

        is >> box.breadth;

        std::cout << "Enter height: ";

        is >> box.height;

        return is;

    }

    // Member function to add two Box objects

    Box operator+(const Box& other) {

        Box result;

        result.length = this->length + other.length;

        result.breadth = this->breadth + other.breadth;

        result.height = this->height + other.height;

        return result;

    }

    // Friend function to compute the volume of the Box

    friend double computeVolume(const Box& box) {

        return box.length \* box.breadth \* box.height;

    }

};

int main() {

    Box box1, box2, result;

    std::cout << "Enter dimensions for Box 1:" << std::endl;

    std::cin >> box1;

    std::cout << "Enter dimensions for Box 2:" << std::endl;

    std::cin >> box2;

    std::cout << "Box 1: " << box1 << std::endl;

    std::cout << "Box 2: " << box2 << std::endl;

    result = box1 + box2;

    std::cout << "Sum of Box 1 and Box 2: " << result << std::endl;

    double volume = computeVolume(result);

    std::cout << "Volume of the sum of Box 1 and Box 2: " << volume << std::endl;

    return 0;

}





