

Week 2- Assignment (2 marks)

Note: All programs must use the appropriate C++ features.

Objective: For the Rectangle class in the lecture, add two integer variables x and y which specify the coordinates of the top-left point of the rectangle (we will assume all rectangles are parallel to the x-y axes), and implement the following tasks

Task1: Overload the << operator so that it prints the contents of the Rectangle.

Task2: Overload the < operator which applies < to the areas of the rectangle operand.

Task3: Overload the == operator which applies == to the areas of the rectangle operand.

Task4: Overload the > operator which applies > to the areas of the rectangle operand.

Task5: Overload the ^ operator to return true if the rectangles do not overlap and false otherwise.

Task6: Overload the + operator to return a new Rectangle with the same x, y as the rectangle before the operator + and an area equal to the sum of the two Rectangle operands. The width of the new Rectangle must be the average of the widths of the two rectangle operands.

Task7: Add a public method to Rectangle which returns the area of overlap of two Rectangles.

The input and output should be like below:

Input:

```
int main()
{
    cout<<boolalpha<<endl; //print ture/false instead of 1/0

    Rectangle r1(0, 0, 3, 4);
    cout << "Task1: rectangle r1: \n" <<r1 <<endl;
    Rectangle r2(1, 2, 3, 2);
    cout << "Task2: r1 < r2:" <<(r1 < r2) << endl;
    cout << "Task3: r1 == r2:" <<(r1 == r2) << endl;
    cout << "Task4: r1 > r2:" <<(r1 > r2) << endl;
    cout << "Task5: r1 ^ r2:"<< (r1 ^ r2) << endl<< endl;
    cout << "Task6: r1 + r2: \n"<< (r1 + r2) << endl;
    cout << "Task7: area of overlap: "<<r1.area_of_overlap(r2) << endl<< endl;
    return 0;
}
```

Output:

```
Task1: rectangle r1:  
Coordinates: 0, 0  
Width: 3  
Length: 4  
Area: 12  
  
Task2: r1 < r2:false  
Task3: r1 == r2:false  
Task4: r1 > r2:true  
Task5: r1 ^ r2:false  
  
Task6: r1 + r2:  
Coordinates: 0, 0  
Width: 3  
Length: 6  
Area: 18  
  
Task7: area of overlap: 4
```

Submit:

- 1, week2.cpp: the c++ source code
- 2, week2.txt: a txt file contains the c++ code.
- 3, output.jpg, or output.png, or output.bmp: a screenshot of the output by your program

Please refer to the submission page for the Marking Rubric.