

## CSCE 240 - Programming Assignment Four

**Due:** 11:59pm on Tuesday, April 1

### Purpose - Implement the following two classes

#### **Weight**

Create a *Weight* class that holds the value and units of a weight in private double and string data members, respectively. The class should allow for the units to be ounces, pounds, grams, or kilograms. The class will contain a constructor, a *ConvertUnits* member function, and accessor and mutator functions for the private data members. You will also need to overload the `<=` operator and the stream insertion operator (`<<`) for the *Weight* class.

Read the comments in the supplied *weight.h* header file for more detailed requirements.

Also, review initial tests for constructor, mutators, and accessors in *testweight1.cc*.

Review initial tests for the *ConvertUnits* function in *testweight2.cc*.

Review initial tests for the `<=` operator in *testweight3.cc*.

And review initial tests for the stream insertion operator in *testweight4.cc*.

If you place all of the attached files in the same directory, you can run the initial tests with the commands

```
make testweight1
make testweight2
make testweight3
make testweight4
```

You are strongly encouraged to create more rigorous tests.

#### **WeightRange**

Create a *WeightRange* class that two *Weight* objects, one to hold the minimum value of the range and one to hold the maximum value of the range, as private data member. The class will include two constructors, an *InRange* member function, a *Width* member function, and accessor and mutator functions for the private data members.

Read the comments in the supplied *weightrange.h* header file for more detailed requirements.

Also, review initial tests for constructors and accessors in *testweightrange1.cc*.

Review initial tests for the mutator functions in *testweightrange2.cc*.

Review initial tests for the *InRange* function in *testweightrange3.cc*.

And review initial tests for the *Width* function in *testweightrange4.cc*.

If you place all of the attached files in the same directory, you can run the initial tests with the commands

```
make testweightrange1
make testweightrange2
make testweightrange3
make testweightrange4
```

You are strongly encouraged to create more rigorous tests.

### **Additional Specifications**

- Add all code for the definition of the *Weight* class to the attached *weight.h* header file.
- Include all of the necessary code for the *Weight* class, including the implementations of the public member functions and the overloaded stream insertion operator, in the attached *weight.cc* source file.
- Add all code for the definition of the *WeightRange* class to the attached *weightrange.h* header file.
- Include all of the necessary code for the *WeightRange* class, including the implementations of the public member functions, in the attached *weightrange.cc* source file.
- You will submit a zip file (only a zip file will be accepted) containing *weight.h*, *weight.cc*, *weightrange.h* and *weightrange.cc* to the assignment in Blackboard.
- Source files must compile and run on a computer of the instructor's choosing in the Linux lab (see your course syllabus for additional details).
- Your programming assignment will be graded with modified versions of the test files *testweight1.cc*, *testweight2.cc*, *testweight3.cc*, *testweightrange1.cc*, *testweightrange2.cc*, *testweightrange3.cc*, and *testweightrange4.cc*

### **Grade Breakdown**

Style *weight.h*: 0.25 points

Style *weight.cc*: 0.25 points

Style *weightrange.h*: 0.25 points

Style *weightrange.cc*: 0.25 points

Documentation: 1 point

Clean compilation of *weight.cc*: 0.5 points

Clean compilation of *weightrange.cc*: 0.5 points

*Weight* class passes modified *testweight1.cc* tests: 1 point

*Weight* class passes modified *testweight2.cc* tests: 1 point

*Weight* class passes modified *testweight3.cc* tests: 1 point

*Weight* class passes modified *testweight4.cc* tests: 0.8 points

*WeightRange* class passes modified *testweightrange1.cc* tests: 0.8 points

*WeightRange* class passes modified *testweightrange2.cc* tests: 0.8 points

*WeightRange* class passes modified *testweightrange3.cc* tests: 0.8 points

*WeightRange* class passes modified *testweightrange4.cc* tests: 0.8 points

The penalty for late program submissions is 10% per day, with no program being accepted after 3 days.