Yoobee Colleges
Bachelor of Software Engineering
CS105 Development Principles 2
Lab 1 (Week 2)

Start Date: Thu, 29-07-2021
Submission date: Fri, 06-08-2021 5pm

Scenario :

The Ocean Race 2021-22 route is announced. Yachts are ready to sail and will visit 10 international cities, including the start port and the Grand Finale finish in Genoa, Italy. In ocean navigation, degrees and minutes (for latitude and longitude) are used to measure locations along with the direction. Degrees of latitude are either north (N) or south (S) measured from 0 to 180 degrees and degrees longitude are either east (E) or west (W) measured from 0 to 90. Example: 38°56'N, 71°0'W is 38 degrees 56 minutes North and 71 degrees 0 minutes West.

Task:

1. Your task is to create a ***class Yacht*** that includes the yacht's *number* and *location*.
    a) For Yacht's Number : You have to number each ***yacht*** *object* as it is created using a ***constructor***. To do this , you will have a data member that holds a serial number for each object created from the class. Then you will need another data member that records a count of how many objects have been created so far.
    b) For Yachts Location : Create a *class* ***Location*** that has three member variables --
        i) int for *degrees* (explained above)
        ii) float for *minutes* (explained above)
        iii) Char for d*irection* letters N,S,E,W
        Location class has variables like *longitude* and *latitude*. *Location class* includes one member ***getpos()*** which obtains a location value in degrees (between 0-180) and minutes (between 0 to 60) and direction (N,S,E,W) from the user.
    c) One member function [***get_pos()*** *]* of the ***Yacht*** *class* should get a position from the user and store it in the object; Another member function [***display()*** *]* should report the yacht number and location. ***display()*** use two variables from ***Location class*** to represent the yacht's location, *latitude* and *longitude*. ***display()*** function will display the location latitude and longitude in *148°26' N format.*
    d) The ***main()*** program creates three yachts, asks the user to input the location and then displays each yacht's number and location.
2. Prepare the UML class diagram for the *Location class*.

Note: Use the hex character constant '\xF8' to display a degree symbol (°).

Sample output :

```
**************Ocean Race 2021-22***************

***************************************
Enter the Location of the first ship:
Input degrees between 0 and 180: 120
Input minutes between 0 and 60: 45
Input direction (E/W/N/S) : E
Input degrees between 0 and 180: 34
Input minutes between 0 and 60: 56
Input direction (E/W/N/S) : N
***************************************
Enter the Location of the second ship:
Input degrees between 0 and 180: 34
Input minutes between 0 and 60: 12
Input direction (E/W/N/S) : W
Input degrees between 0 and 180: 78
Input minutes between 0 and 60: 34
Input direction (E/W/N/S) : S
***************************************
Enter the Location of the third ship:
Input degrees between 0 and 180: 179
Input minutes between 0 and 60: 23
Input direction (E/W/N/S) : E
Input degrees between 0 and 180: 126
Input minutes between 0 and 60: 45
Input direction (E/W/N/S) : S

**************Welcome to Ocean Race 2021-22***************


The ship serial number is :1
and it`s position is : 34°56 N Latitute  120°45 E Longtitute

The ship serial number is :2
and it`s position is : 78°34 S Latitute  34°12 W Longtitute

The ship serial number is :3
and it`s position is : 126°45 S Latitute  179°23 E Longtitute
```

Submission:

- Compressed C++ Project folder.

Rubrics

Criteria	Weightage
Best practices (Use of appropriate C++ syntax for creation of class and constructor, access specifiers, loops, conditional statements and appropriate comments)	**1**
Creating yacht class, constructor and its implementation	**2**
Creating location class and its implementation	**2**
Class member function implementation along with necessary input for desired output	**2**
main() implementation	**2**
UML class diagram	**1**
Total	**10**