Week 6:Operator Overloading, Friend Function

Learning Materials: Chapter 8

Task 0

Goto page 351-356 copy the code times1.cpp and times2.cpp . Run the codes in your IDE and understand how the cast operator works. You need to explain later.

Task 1

Create a class "**Coordinate**". An object of the **Coordinate** class stores the abscissa and ordinate (float type).
Implement the following **public** member functions (task of the function is written after a hyphen):

- **Necessary constructor, destructor and display function.**
- **float getDistance(Coordinate c)** - Distance from object c
- **float getDistance()** - Distance from origin (0,0) coordinate
- **void move_x(float val)** - val will be added to member data abscissa
- **void move_y(float val)** - val will be added to member data ordinate
- **void move(float val) -** move_x(val) and move_y(val) will be called
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Write necessary member or non member functions to achieve following functionalities.

- Assume c1,c2,c3 are Coordinate objects. Overload the following comparison operators >,<,>=,<=,==,!= where distance from the origin of each operand will be compared. Example c1 == c2 returns true when c1 contains (abscissa = 1, ordinate = 1) and c2 contains (abscissa = -1, ordinate = -1)
- Unary operator ++ will move a coordinate object 1 unit in x and y direction. Implement prefix and postfix according to the convention.
- Unary operator -- will move a coordinate object -1 unit in x and y direction. Implement prefix and postfix according to the convention.

Task 2

Create a class **FLOAT** that contains **one float data member.** Suppose f1,f2,f3,f4 are four objects of class **FLOAT**.Overload all the four arithmetic operators(+,-,*,/) so that they can operate on the objects of **FLOAT**.For example: ***FLOAT operator+(FLOAT f1)*** for (+) operator.

- Also implement an operator overloading function to achieve the following functionalities. (Learn from task 0)
  ```
  Float f1(5.052);
  int i = f1; // this will store value 5 in i
  ```

Task 3

*[You can use **your** solution code of Lab 4, Read the following instruction **VERY CAREFULLY** as you must refactor the code for today’s task]*

You are asked to create a class **"ZooAnimal"** that matches the following criteria:

Private members:

nameOfAnimal	: character string
birthYear	: integer
cageNumber	: integer
weightData	: float
height	: integer

Public members:

- Write the member function **int operator == (int data)** to overload the **==** operator. Use the standard **==** operator to compare the **weightData** data member of the ZooAnimal object to the integer parameter.
- Write the member function **void operator-- (int dec)** to overload the **auto-decrement** operator.Use the standard **-=** operator to decrease the ZooAnimal object's **height** by integer parameter (centimeter).