New Concept Assignment (NC) #24

Start Assignment

Due Saturday by 11:59pm **Points** 16 **Submitting** a text entry box or a file upload
Available Apr 23 at 12am - Apr 30 at 11:59pm 8 days

C++ Project Name: NC24_GetToThePoint

Implement a class named Point that represents a two-dimensional point, with an x and y value. The Point class should have the following member variables (a.k.a. attributes):

m_x (the x-value of the point, as a whole number)
m_y (the y-value of the point, as a whole number)

The Point class will have methods to:

Create a new Point (given an x-value and y-value) [constructor]
Create a new Point (given no parameters, initialize x-value and y-value to 0) [default constructor]
getX
getY
setX
setY
distanceTo(const Point &other)
overloaded == operator [to check if one Point is the same as another]
overloaded = operator [to assign all the member variables of this Point to all the member variables of another Point]

Friend Function:
Overload cout 's << operator to work with the Point class to display a string, e.g. "Point [x=0,y=5]" if the x-value is 0 and y-value is 5

The distanceTo method can be implemented with the following equation for distance:

$$d = \sqrt{(\Delta x)^2 + (\Delta y)^2} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}.$$

Now, implement a class named Line that represents a two-dimensional line, consisting of two points. The Line class should have the following member variables (a.k.a. attributes):

m_p1 (the first Point of the line)
m_p2 (the last Point of the line)

The Line class will have methods to:

Create a new Line (from two x-values and two y-values) [parameterized constructor]
Create a new Line (from two Points) [another parameterized constructor]

getP1
getP2
getX1
getY1
getX2
getY2
setP1
setP2
setX1
setY1
setX2
setY2

length( ) [method that calculates the length of the Line]
overloaded == operator [member function to check if one Line is the same as another]
overloaded = operator [to assign all the member variables of this Line to all the member variables of another Line]

Friend Function:
Overload cout 's << operator to work with the Line class to display a string, e.g. "Line[(x1=0,y1=5), (x2=0,y2=10)]"

After you complete the class, please create a main function that:

1. **Creates a Line l1 with 4 parameterized inputs of 1, 1, 4, 4.**
2. **Create Point p1 and p2. p1 should be the default and p2 should be parameterized 0,4.**
3. **Creates a Line l2 with p1 and p2.**
4. **Display both points to the console**
5. **Displays both lines to the console**
6. **Uses == to determine equality**
7. **Show the distance of p1 to p2.**
8. **Show the length of line2**
9. **Assign l1 to l2**
10. **Use == to determine equality**

When you're finished, please upload each C++ file (*.cpp & .h files) and screenshot (*.jpg or *.png files) here on Canvas.

Please be sure to follow the CS 150 Code and Algorithm Style Sheet for full credit.