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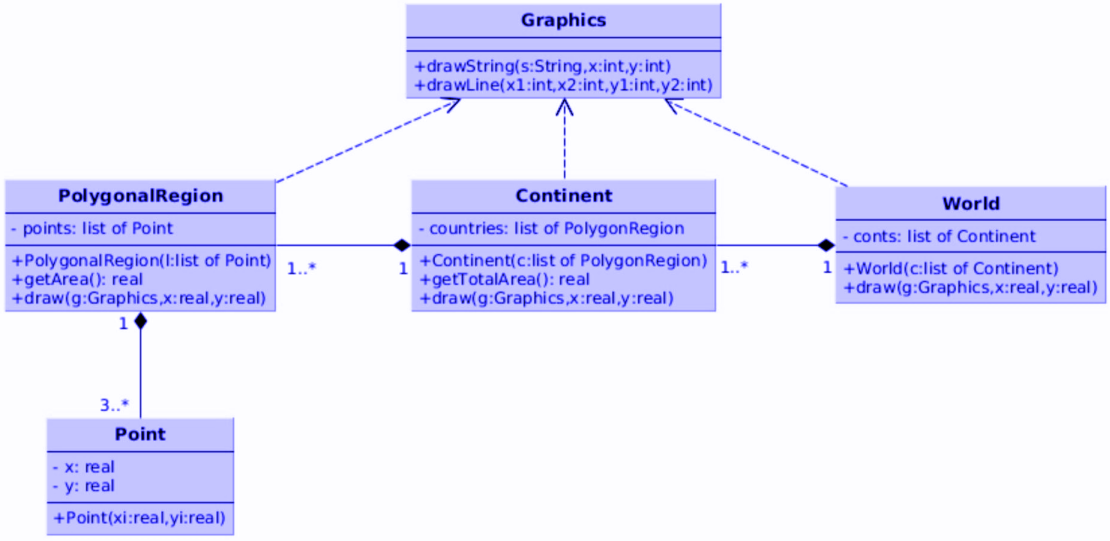
Lab exercise 2: Implementing a program design 24292-Object Oriented Programming

For this lab session we had to implement part of the program design of Seminar 2.Since the program design from Seminar 2 involved a lot of classes, we implemented the code in steps. To start with, we only considered the classes representing polygons, continents and worlds. We already had a design for the classes from the previous seminar and this time it was perfectly matching.

The first part of the implementation was to create a graphical interface in Java. The supplied code included classes MyWindow and MyMap that provided the skeleton for the graphical user interface.



2 Polygonal regions

Although the design included both polygonal and ellipsoidal regions, we only implemented polygonal regions in this lab session. We did not have to implement the classes “Region” and “EllipsoidalRegion”.

To compute the area of a polygon, we assumed that the polygon was convex. Using the following page (which shows how to compute the area of a convex polygon) we were able to create a function x to compute the area.

http://www.mathwords.com/a/area_convex_polygon.htm

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To draw a polygon, we could either use the method drawLine of Graphics to draw each line between a pair
of points of the polygon, or the method drawPolygon which drew the entire polygon at once.

Once we had implemented the PolygonalRegion class we could test it in the graphical interface. to do so, we had to modify the source code of MyMap. we added an attribute To the class MyMap which is a polygonal region. After that, running the program opened a window in which the region was drawn, and also we made it print the total area of the region in the terminal.

3 Continents and World

In addition, we had to implement the classes Continent and World and change the graphical interface so that instead of a single country, the entire world was drawn. To do this, we performed different tasks:

Firstly, we had to Implement the class Continent such that it included a list of polygonal regions. At the beginning we found it hard to use the coordinate system so we did some failed attempts to separate regions with different coordinates. We ended up implementing the regions with different linked lists so that the program did not draw them all within the same figure.

After struggling a bit with the coordinate system we were able to succeed at it.
Second thing was to Implement the class World such that it included a list of continents. The draw method simply listed all the continents that we “declared” with a linked list of geometric points that was a continent datatype.

Finally,we modified the class MyMap such that the attribute was a World rather than a single region. The main method created all the regions, continents as well as the world.
this way we were able to plot both regions, continents and the world. We used a somewhat inceptive system of linked lists so that the world contained continents that contained regions. And when printing them, everything was drawn.