

IT314 - Lab4

Class Modeling

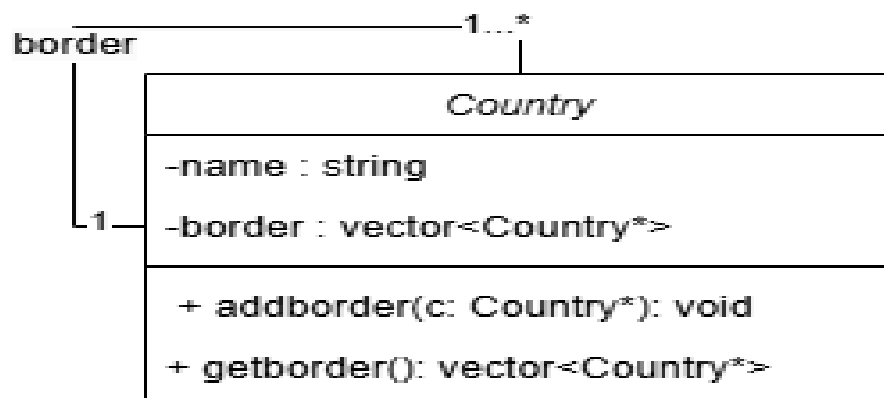
Popatiya Harsh Nitinkumar - 202201463

9th September, 2024

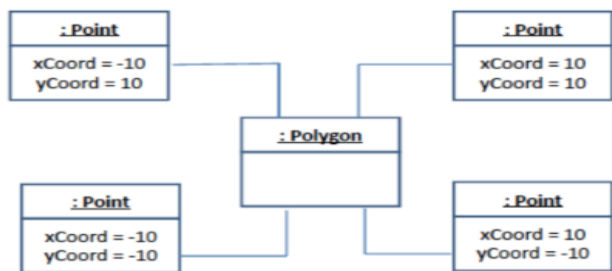
Q.1 Prepare a class diagram for the following object diagram that shows a portion of Europe.



Solution:



Q.2 Prepare a class diagram for the object diagram given in Figure -2. Explain your multiplicity decisions. What is the smallest number of points required to construct a polygon? Does it make a difference whether or not points may be shared between polygons? Your answer should address the fact that points are ordered.



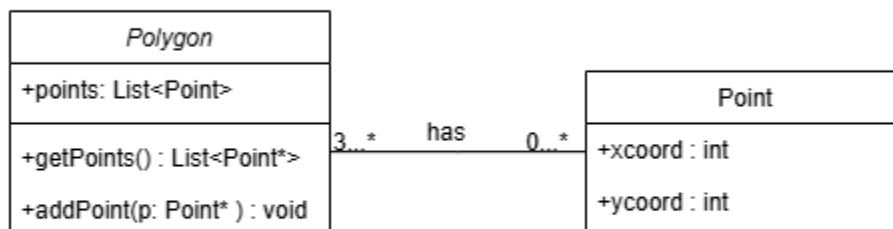
Solution:

One polygon has to have 3 or more than 3 points and one point can be shared by 0 or more than 0 polygons.

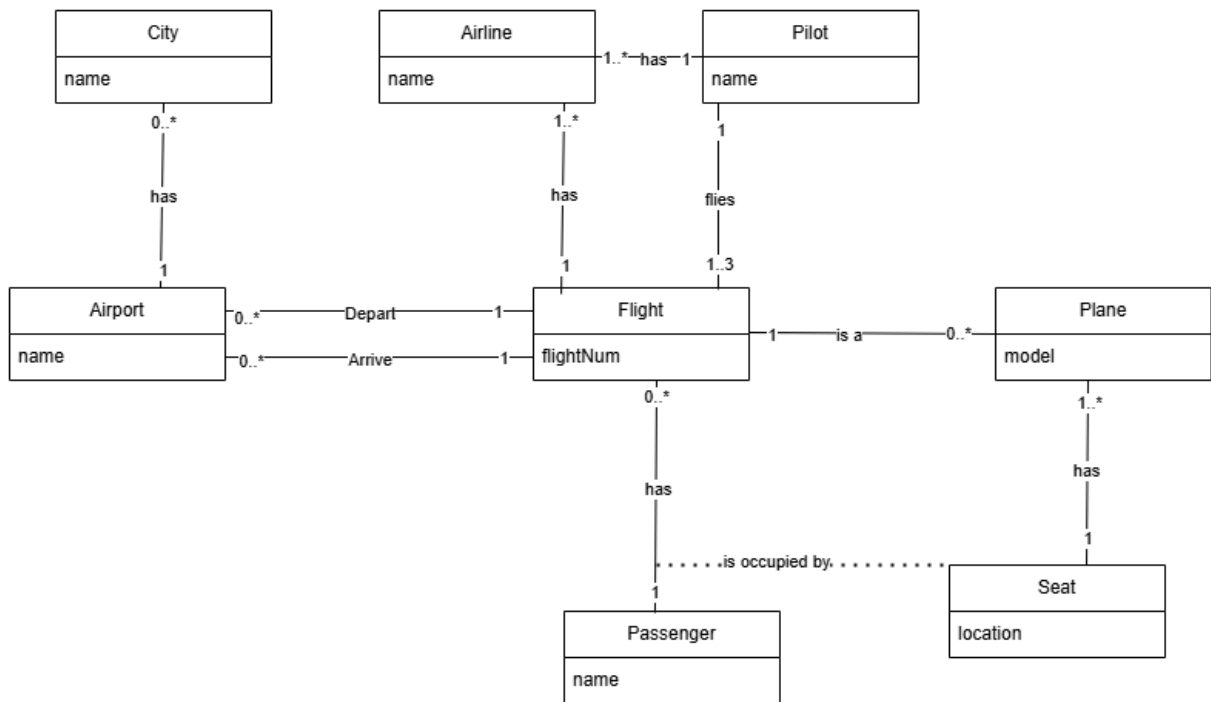
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No it does not make any difference.

If the points are ordered it means that the sequence in which points are connected matters. This ordering ensures that the polygon is properly closed and does not intersect itself incorrectly.



Q.3 Figure 3 is a partially completed class diagram of an air transportation system. Add multiplicities in the diagram. Also add association names to unlabelled associations.



Q.4 We want to model a system for management of flights and pilots. An airline operates flights. Each airline has an ID. Each flight has an ID, a departure airport and an arrival airport: an airport as a unique identifier. Each flight has a pilot and a co-pilot, and it uses an aircraft of a certain type; a flight also has a departure time and an arrival time. An airline owns a set of aircrafts of different types. An aircraft can be in a working state or it can be under repair. In a particular moment an aircraft can be landed or airborne. A company has a set of pilots: each pilot has an experience level: 1 is minimum, 3 is maximum. A type of airplane may need a particular number of pilots, with a different role (e.g.: captain, co-pilot, navigator): there must be at least one captain and one co-pilot, and a captain must have a level 3.

