IT314 Software Engineering

Lab 4: Class Modeling

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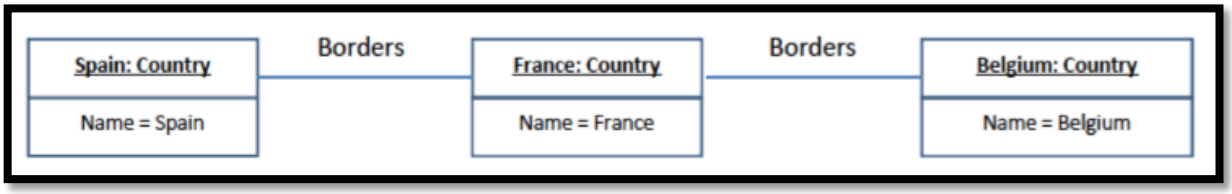
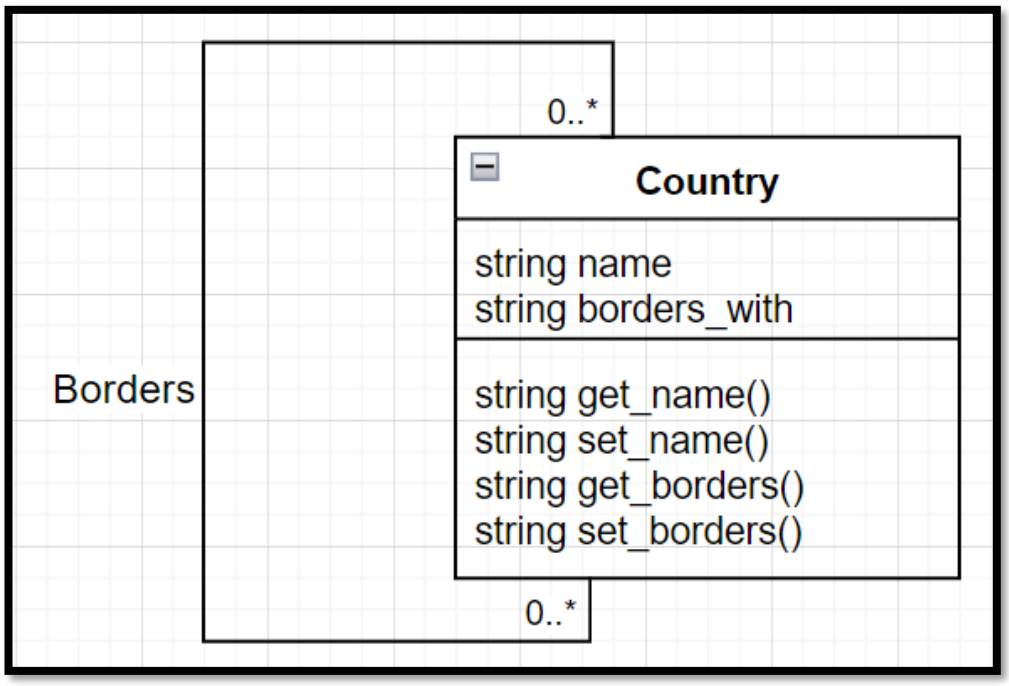
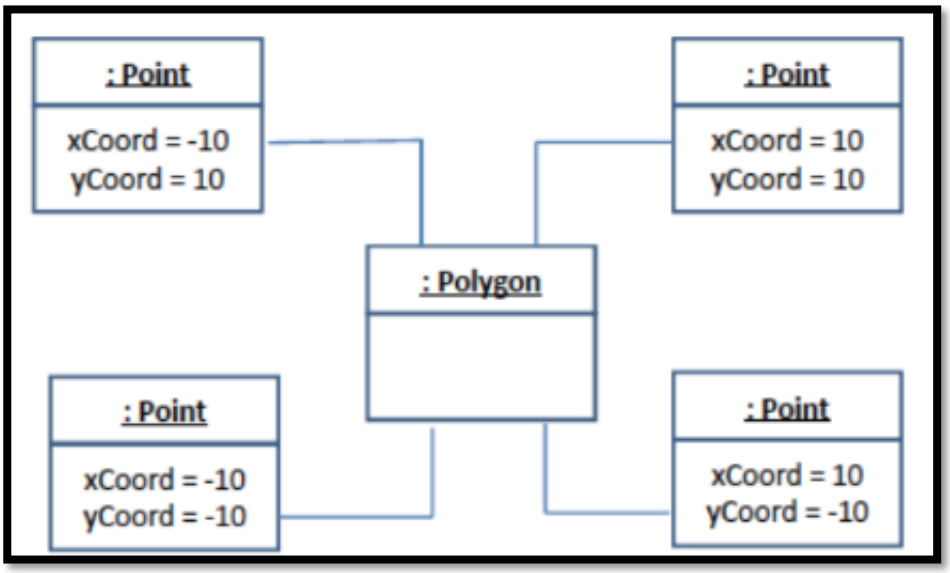
1. Prepare a class diagram for the following object diagram that shows a portion of Europe.



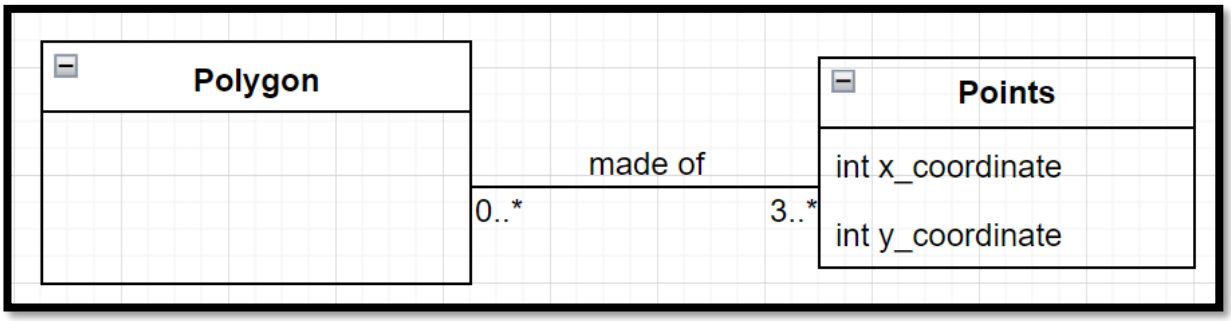
✓ Class Diagram:



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

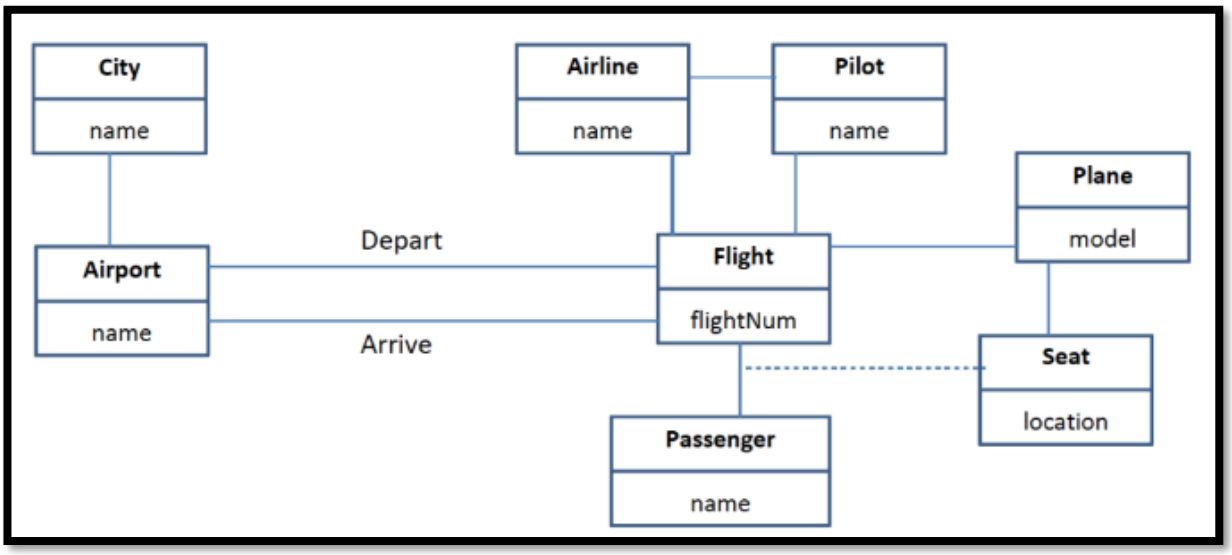


✓ Class Diagram:

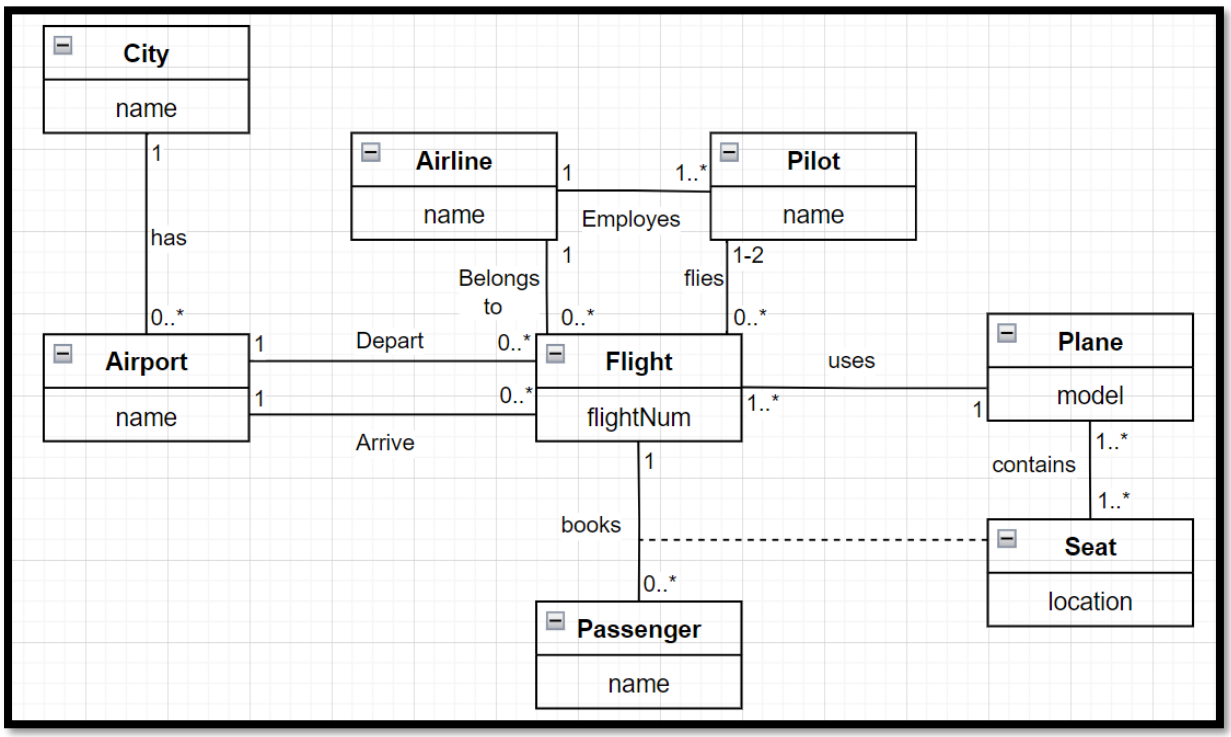


- Polygon can be made when we have at least 3 points as the smallest polygon is a triangle which requires 3 points to be constructed.
- At least 3 points are required to construct a polygon.
- No, it doesn't make any difference if the point is shared or not between the polygons, we will need at least 3 points whatsoever.
- The order of the points does matter as it determines the edges of the polygon and its order of connection. If the points are not ordered, it would not define the structure of the polygon accurately.

3. Given figure is a partially completed class diagram of an air transportation system. Add multiplicities in the diagram. Also add association names to unlevelled associations.



✓ Class Diagram:



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 has also 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 aeroplane 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.

✓ Class Diagram: