

IT314 Lab-4 Class Modeling

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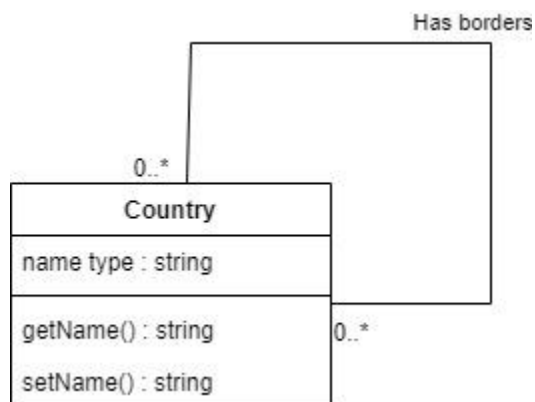
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Q.1 Prepare a class diagram for the following object diagram that shows a portion of Europe.



Figure-1

Class diagram :



Q.2 Prepare a class diagram for 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 point may be shared between polygons? Your answer should address the fact that points are ordered.

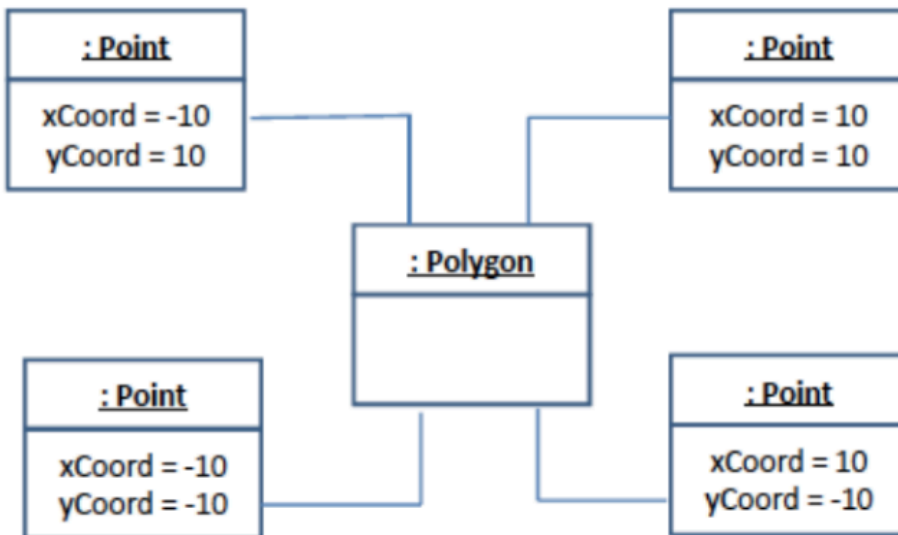


Figure - 2

Classes

Point: Represents coordinates with xCoord and yCoord attributes.

Polygon: Defined by multiple Point objects, as shown in the diagram.

Attributes

Point Class:

xCoord: int

yCoord: int

Polygon Class:

The Polygon class itself does not seem to have additional attributes based on the diagram.

Relationships (Associations)

Polygon and Point:

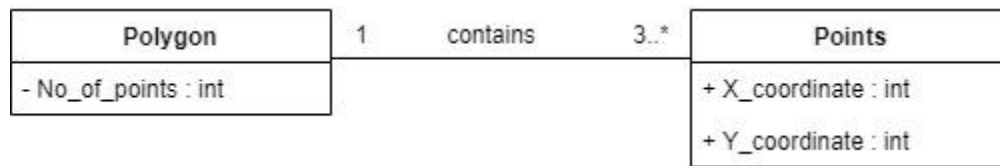
A polygon has a one-to-many relationship with points, and the points must be ordered to form the shape.

Multiplicity: A polygon needs at least 3 points.

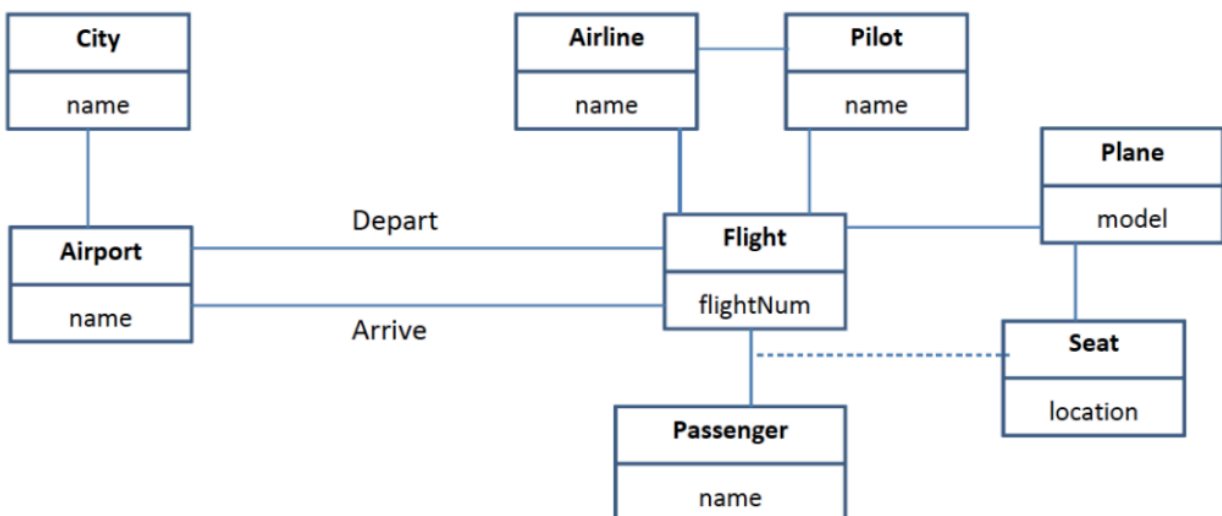
Shared Points:

Points can be shared between polygons, making the relationship many-to-many (multiple polygons can share points).

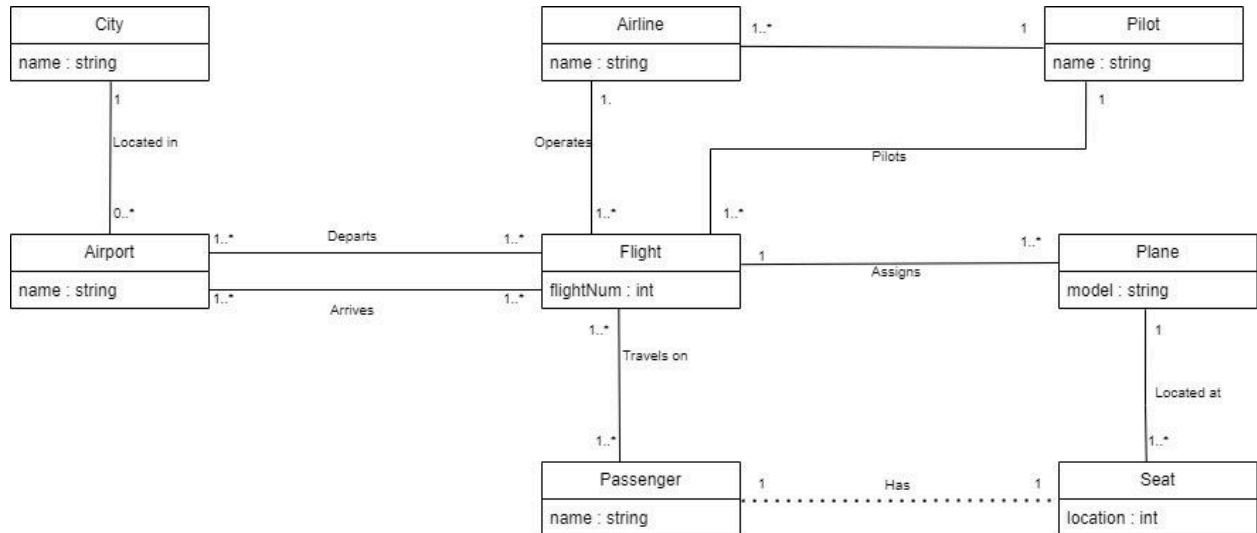
Class Diagram



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 unlevelled associations.



Answer :



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 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.

Answer :

