

Lab 4 Assignment
Lab Session: Class Modeling
IT314 - Software Engineering

Jay Rathod- 202201255

Q1. Prepare a class diagram for the following object diagram that shows a portion of Europe



Figure-1

ANSWER:

- **Class Diagram Structure:**

- ❖ **Class Name: Country**

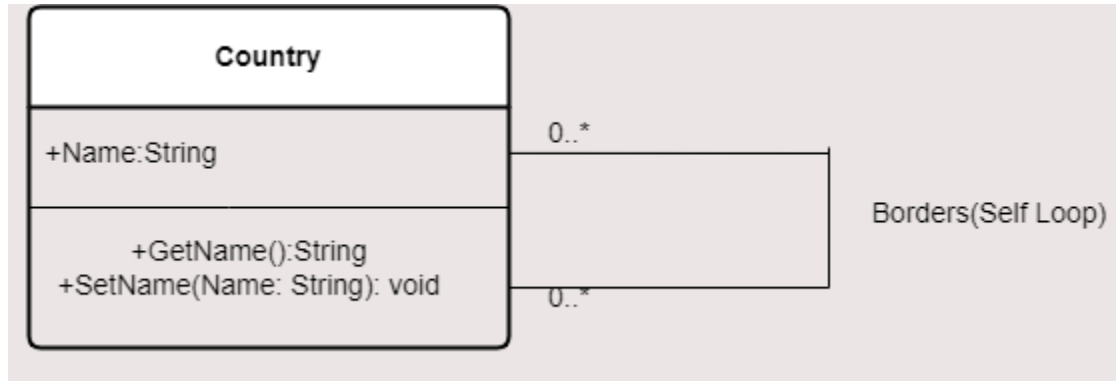
- ❖ **Attributes:**

- ☐ name :String

- ❖ **Associations: Borders : A many-to-many association between the Country class**

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Diagram Representation:



Q2. 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.

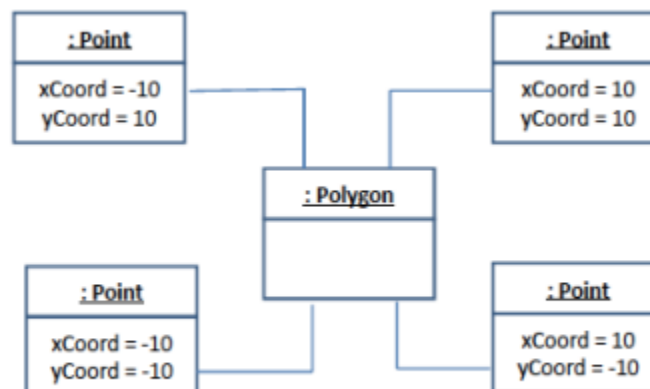


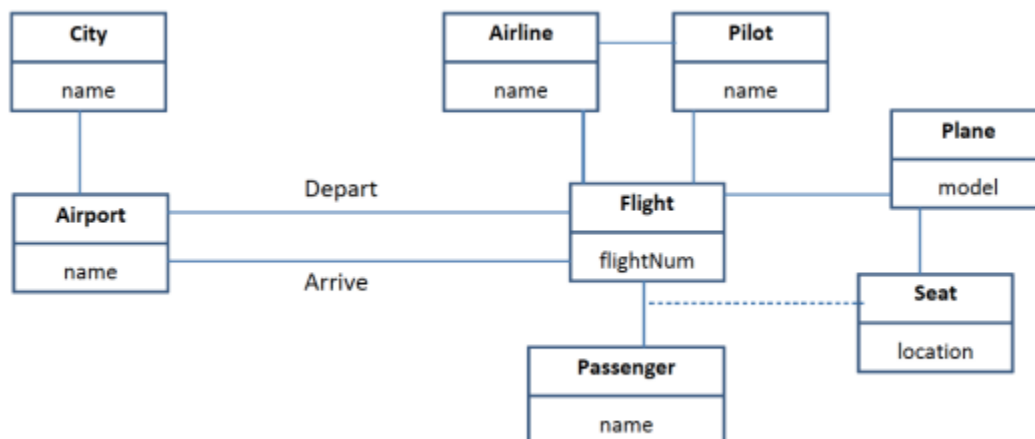
Figure - 2



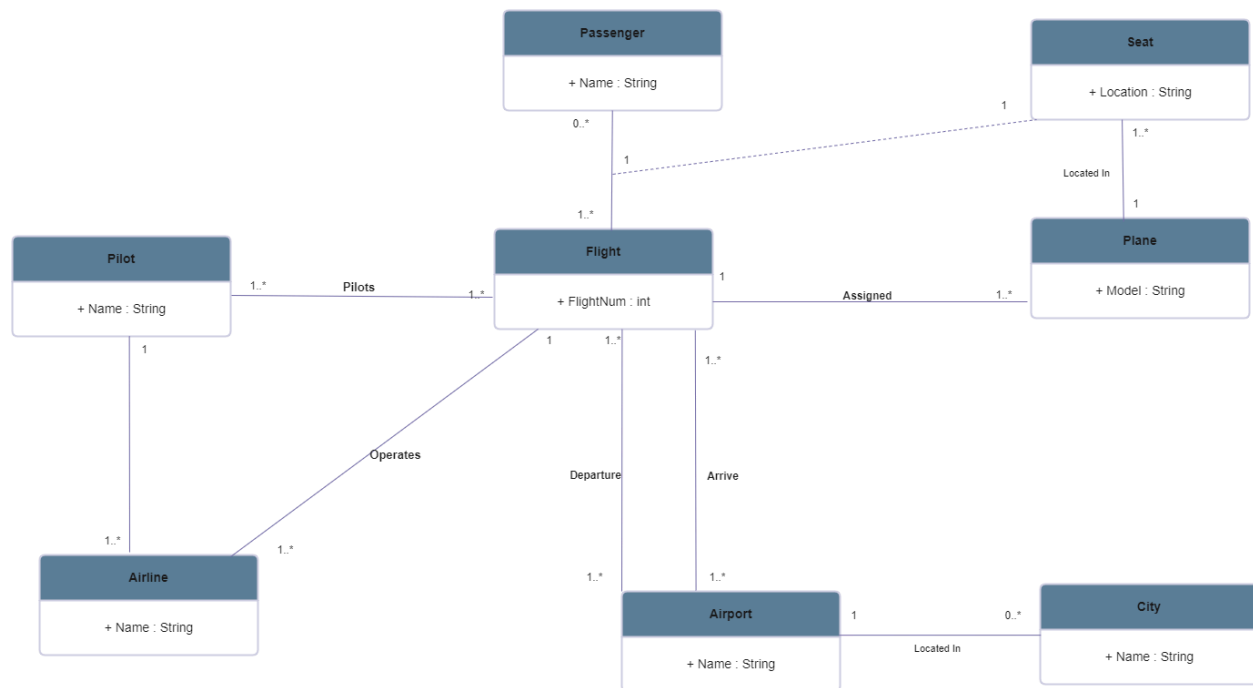
Sharing Points Between Polygons:

Yes, points can be shared between polygons (e.g., neighboring polygons on a mesh or grid may share vertices). This does not affect the validity of the polygon, but it may impact the specific shape depending on how points are shared and ordered.

Q3. 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.



Class Diagram Representation:



Q4 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.

