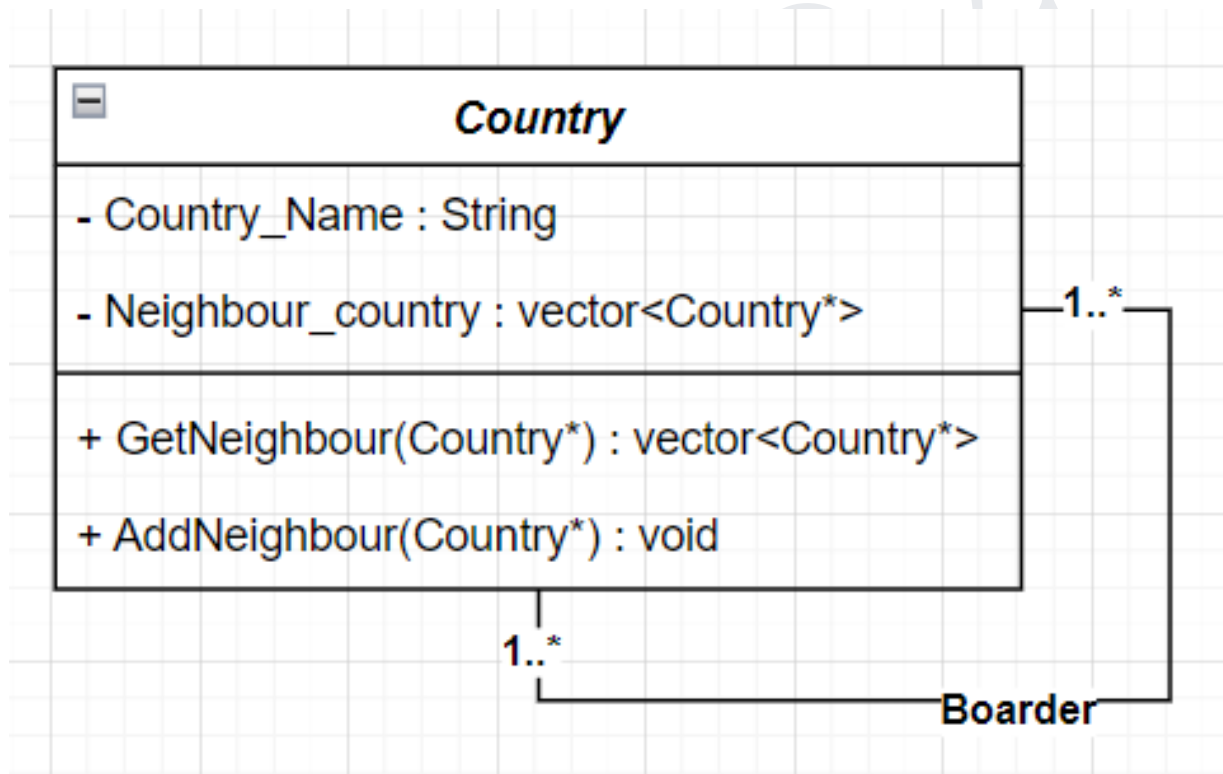# IT314 - Software Engineering
Class Modeling

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

Spain: Country	Borders	France: Country	Borders	Belgium: Country
Name = Spain		Name = France		Name = Belgium

Answer : the following the class diagram for above given object 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.
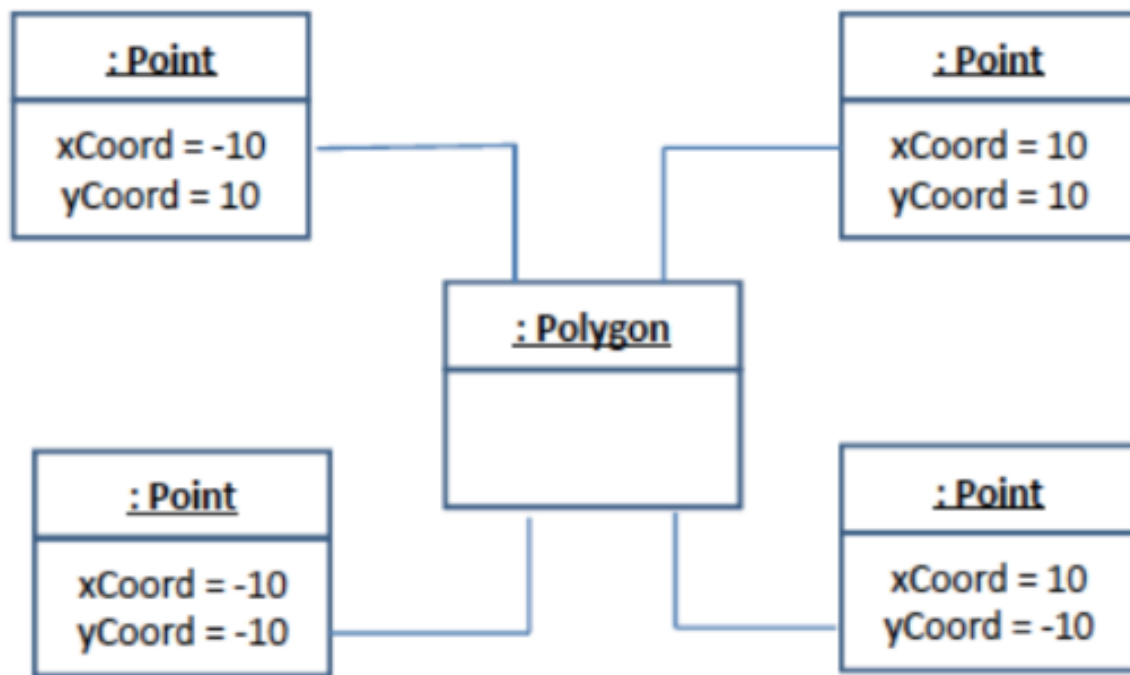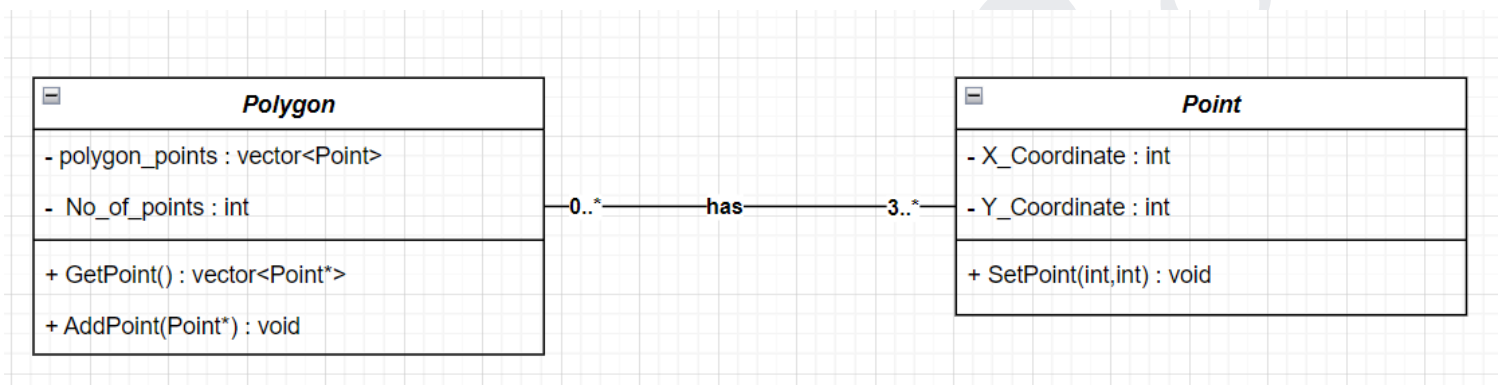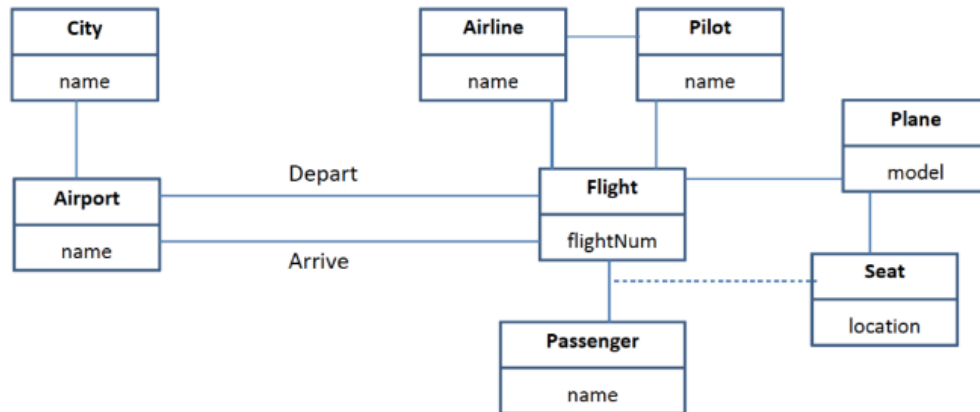

Answer :

- As we know that a polygon should have at least 3 points or it can have many points so multiplicity is **3..*** and a point may not be associated with any polygon or with many polygons so **0..*** for point class.
- In point class, it contains variables named X_Coordinate and Y_Coordinate to store both coordinates and functions to assign values to them.

- In polygon class, it contain polygon_points variable to store the list of points which that polygon has and no_of_points variable to store the count of points in polygon
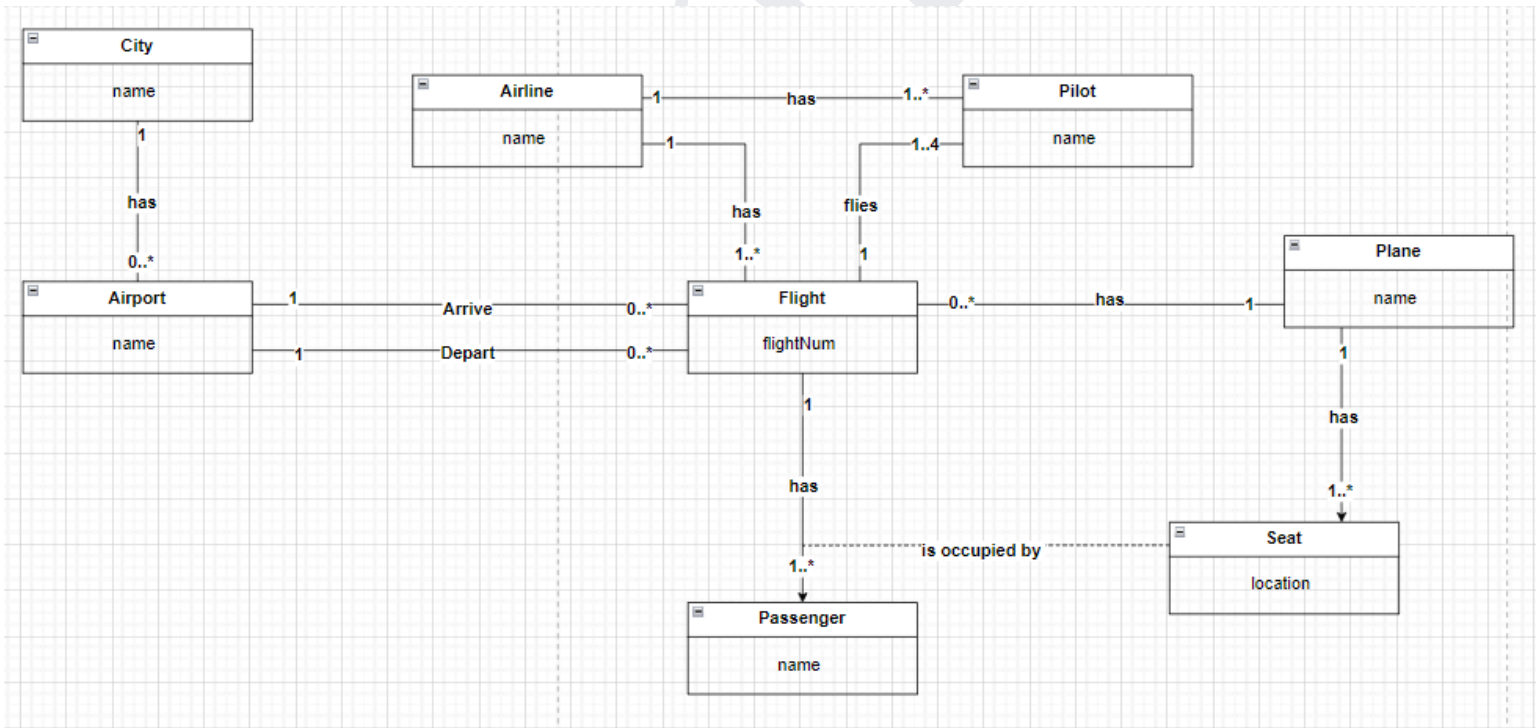
❖ **Class Diagram :**

Polygon
- polygon_points : vector<Point>
- No_of_points : int
+ GetPoint() : vector<Point*>
+ AddPoint(Point*) : void

—0..*————has————3..*—

Point
- X_Coordinate : int
- Y_Coordinate : int
+ SetPoint(int,int) : void

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.