

# SOFTWARE ENGINEERING (IT-314)

## LAB-4

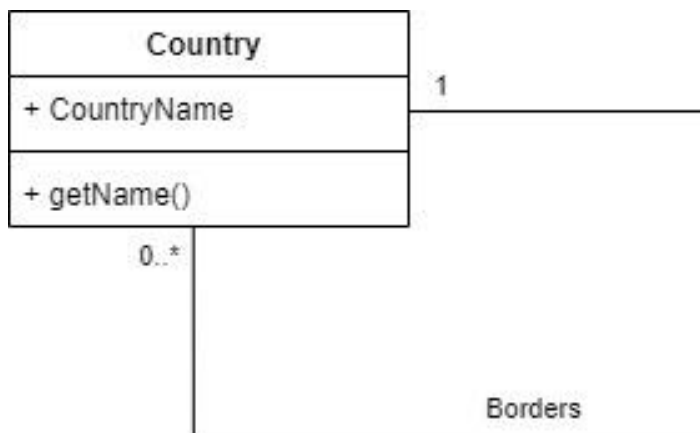
Name: Jainil Patel

SID: 202201030

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



Figure-1



**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.

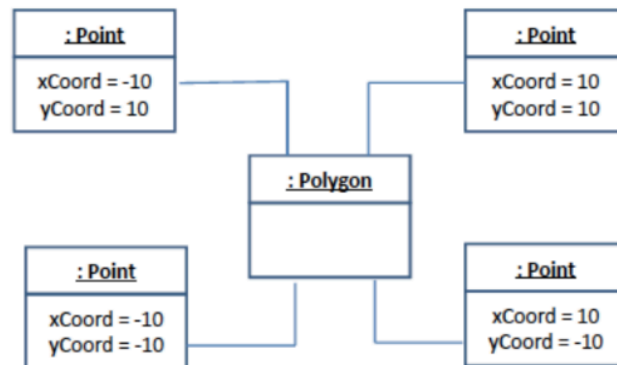
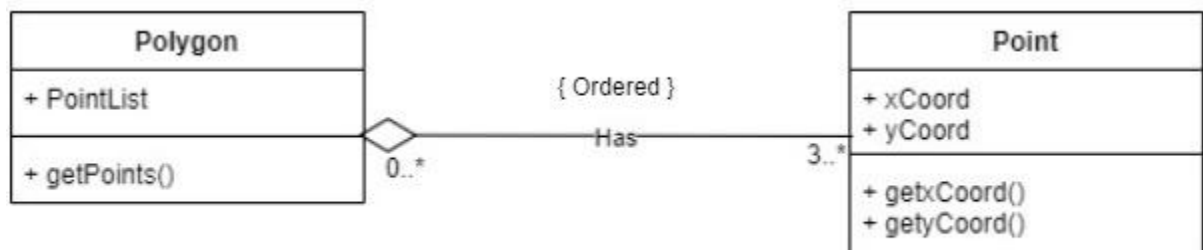


Figure - 2

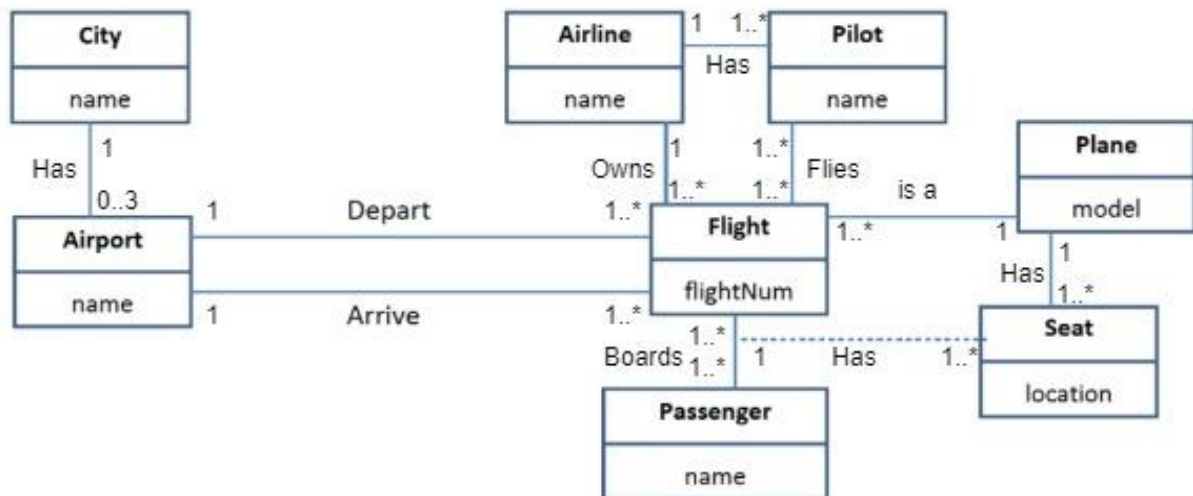
- Smallest number of points required to form a polygon=3
- The smallest polygon is a triangle which requires 3 non collinear points.
- The points are ordered as here we do not want any duplicates



- As we know that a polygon needs at least 3 points, therefore that explains “3..\*” multiplicity.
- Sharing or non sharing does not change the fact that the polygon need 3 points minimum. It won’t change the polygon unless the points are collinear

**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.

➤ Completed class diagram



➤ **Assumptions for above multiplicity**

- We assume that any city has 0-3 airports ( Domestic,International,Air Force Airport).
- We assume that a single flight is not always operated by the same pilots every day, meaning that multiple pilots can be assigned to the same flight number.
- We also consider the possibility that a passenger may occupy more than one seat.

**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.

