IT313 - SOFTWARE ENGINEERING
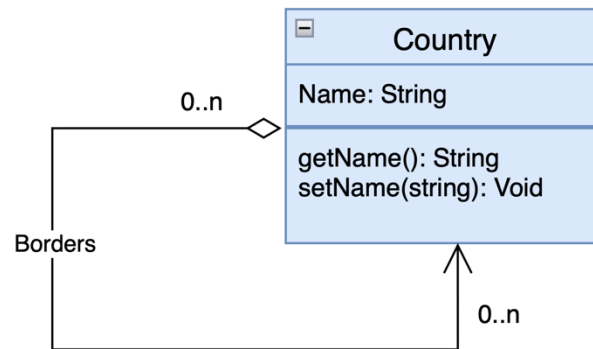
LAB – 4

202201192 – SMIT SHAH

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

Ans :

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.

Ans :
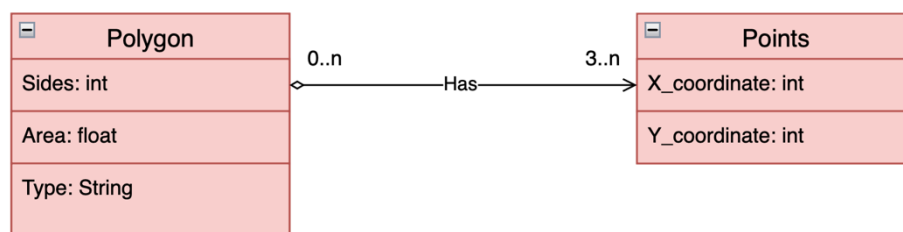
Multiplicity is decided by the fact that a polygon needs atleast 3 points (can be more) and a point can be part of either zero or more polygons.

Minimum number of points required for polygon is '3'.
With three points we can make a triangle.

If two polygons are not connected then min. points required are '6' whereas if connected min. points required are '4'.

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.

Ans :
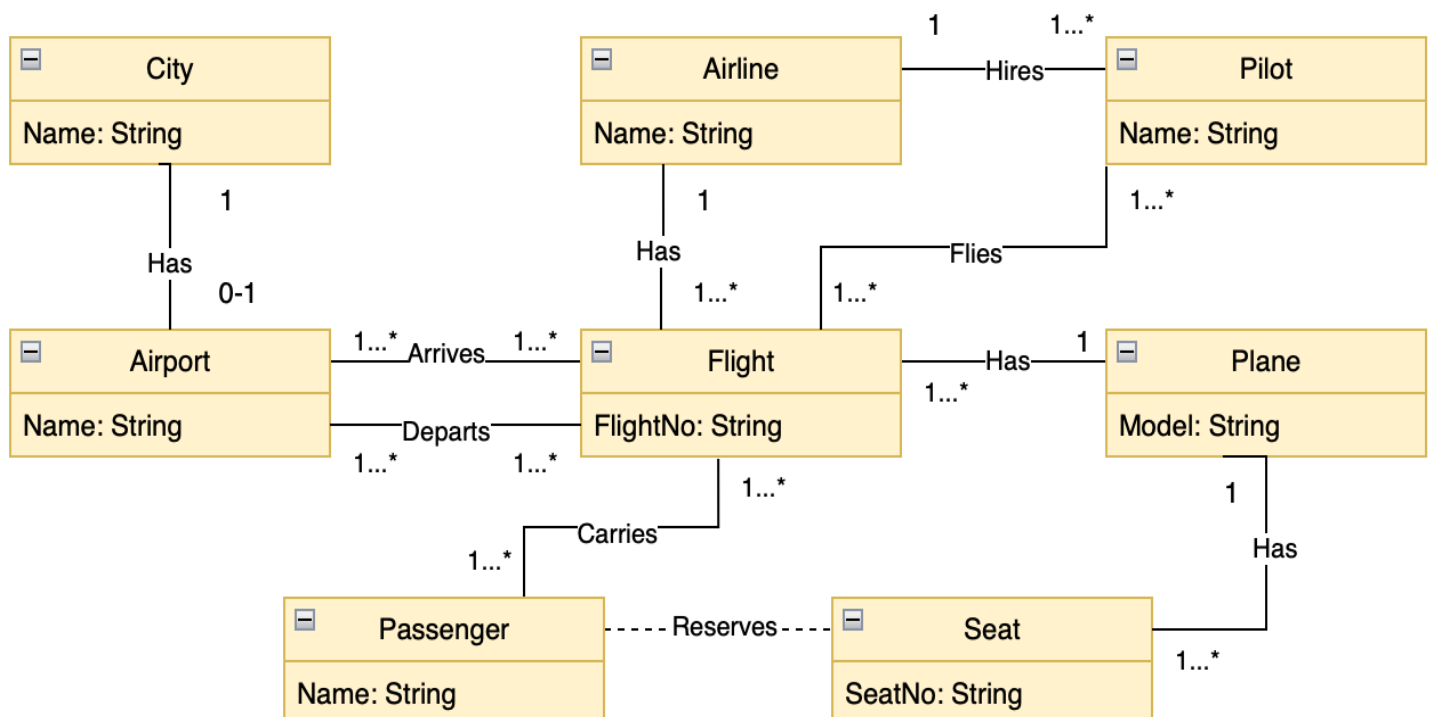
Q.4) We want to model a system for management of flights and pilots. An airline operates flights. Each airline has an ID. Each flight has an ID a departure airport and an arrival airport: an airport as a unique identifier. Each flight has a pilot and a co-pilot, and it uses an aircraft of a certain type; 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.
Ans :

Airline		Flight			Airport
Name: String	1 — Operates — 1..*	ID: String	1..* — Arrives — 1..*		ID: String
	1	Arrival Time: Time	1..* — Departs — 1..*		
		Departure Time: Time			

1 Owns 1..*

Employs

Flown by

Aircraft			Pilot		Pilot_1
Name: String			Name: String		Level: String
Working Status: String	1..*	1..*			Pilot_2
Flying Status: String		1			Level: String

Copilot

Navigator

is a

Aircraft Type		Pilot_3
Name: String	1..* — Captain — 1	Level: String