

## Lab 4 : Software Engineering IT314

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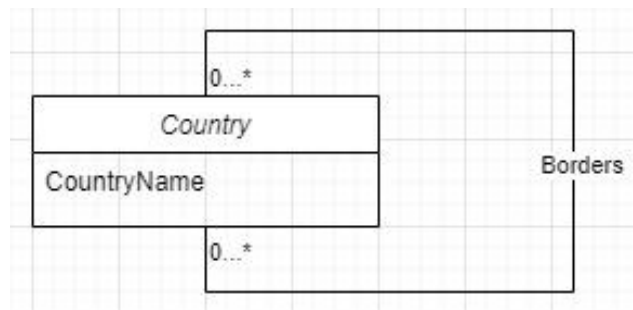
Roll No: 202201335

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



Figure-1

A1. The Class Diagram is as shown below:



Q2. 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.

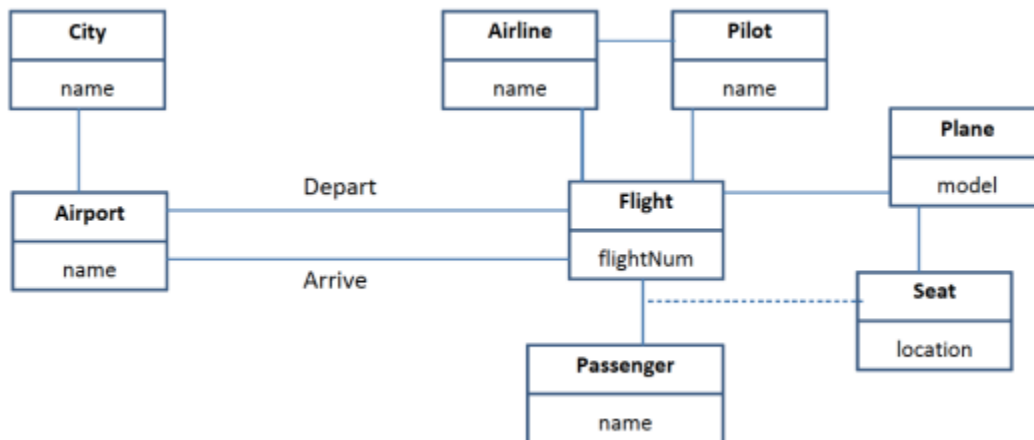
A2.



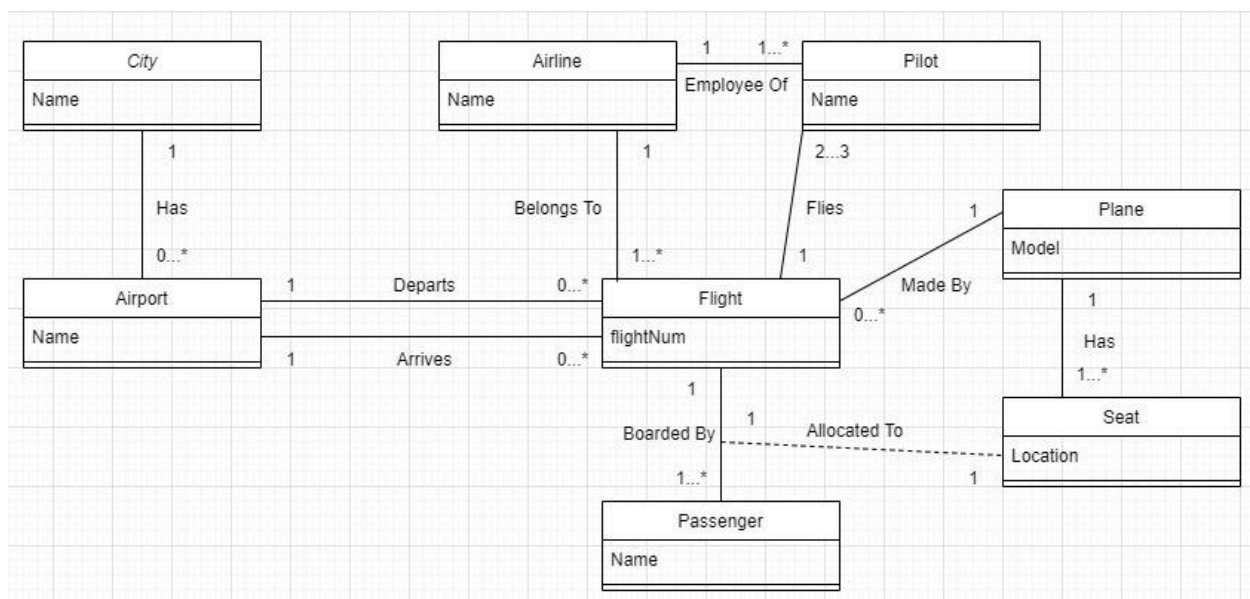
- Since, the smallest possible polygon is of 3 sides i.e triangle thus minimum 3 points are required. There is no upper limit on the number of points in a polygon.
- A point may be shared between many polygons or be a point of none of polygon and have independent existence

- The order of points makes difference since if there are 4 points and joined in haphazard manner then they cannot form a polygon.

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.



A3. The completed class diagram is as follows,



- Here, we assume that there are only 2 to 3 pilots in a flight.

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.

A4.

