IT314: Software Engineering
LAB-4

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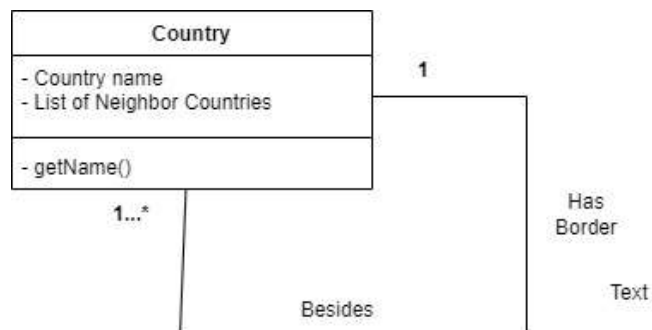
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Class Modelling

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

Figure-1

ANS –

Q.2 Prepare a class diagram for the object diagram given in Figure -2. Explain your multiplicity of decisions. What is the smallest number of points required to construct a polygon? Does it make a difference whether or not a point may be shared between polygons? Your answer should address the fact that points are ordered.
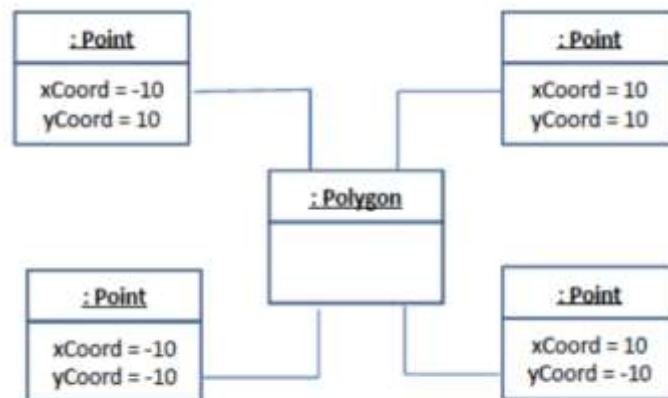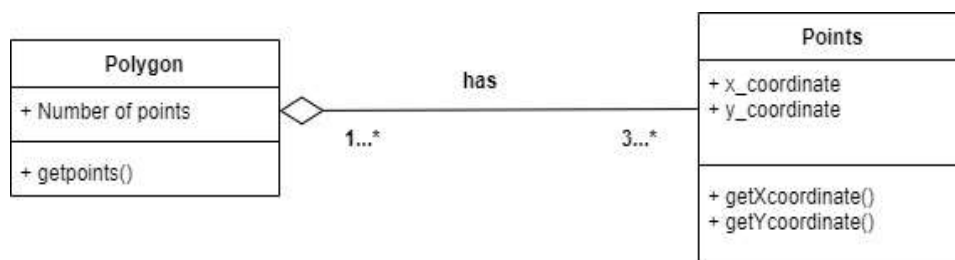

Figure - 2

ANS –

- The smallest number of points required to form a polygon = **3 (Triangle)**
- Sharing points does not affect the minimum number of points required, as each polygon still needs at least 3 distinct, non-collinear points to form a valid polygon, such as a triangle.
- The points are ordered as here we do not want any duplicates.

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.
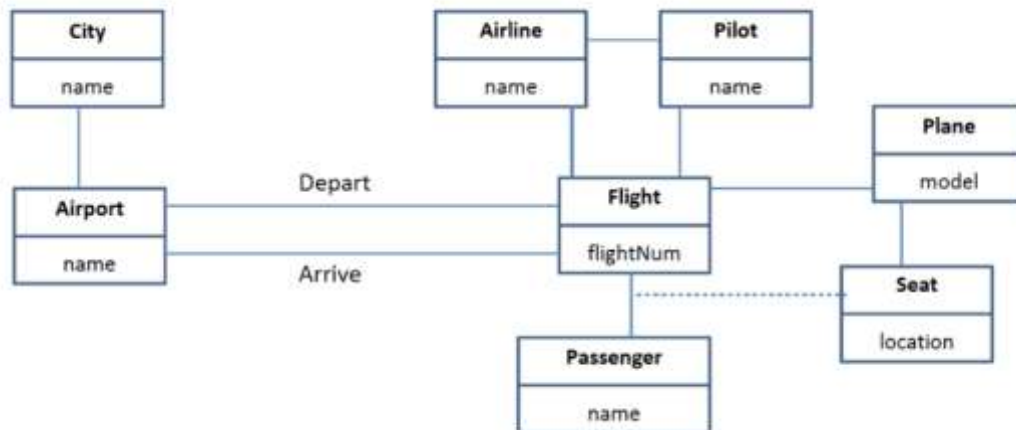
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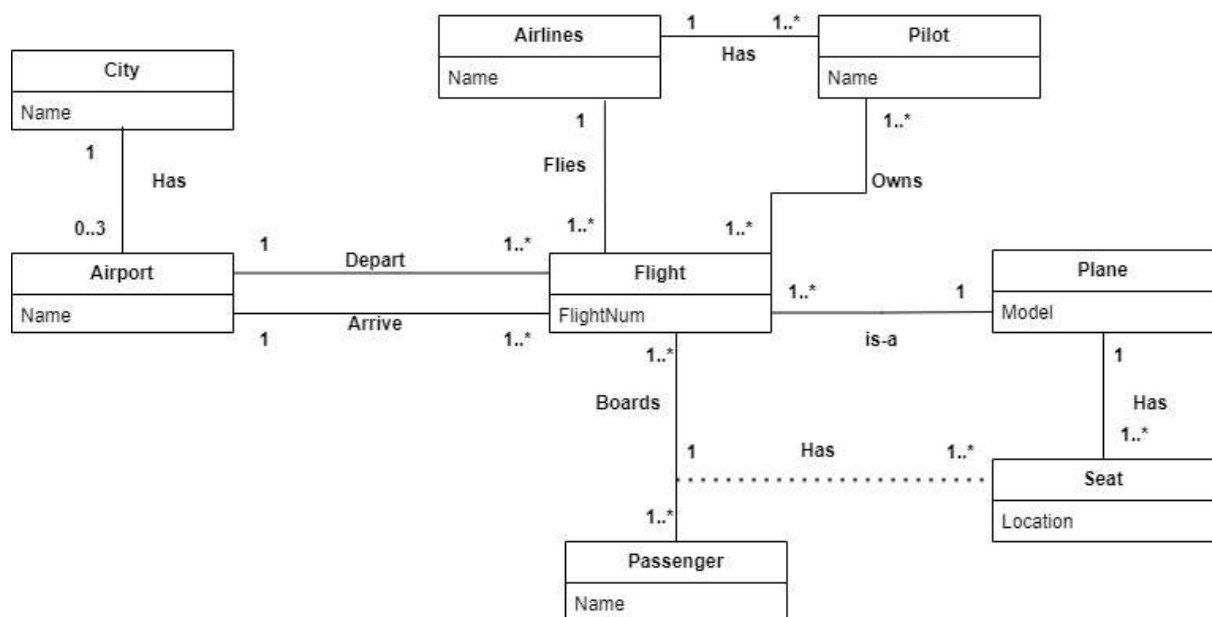
Assumptions for the above multiplicity:

- A city may have between 0 and 3 airports(at max).
- The same flight can be operated by different pilots on different days, so multiple pilots might be assigned to a single flight number.
- A single 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.

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