IT314 : Software Engineering
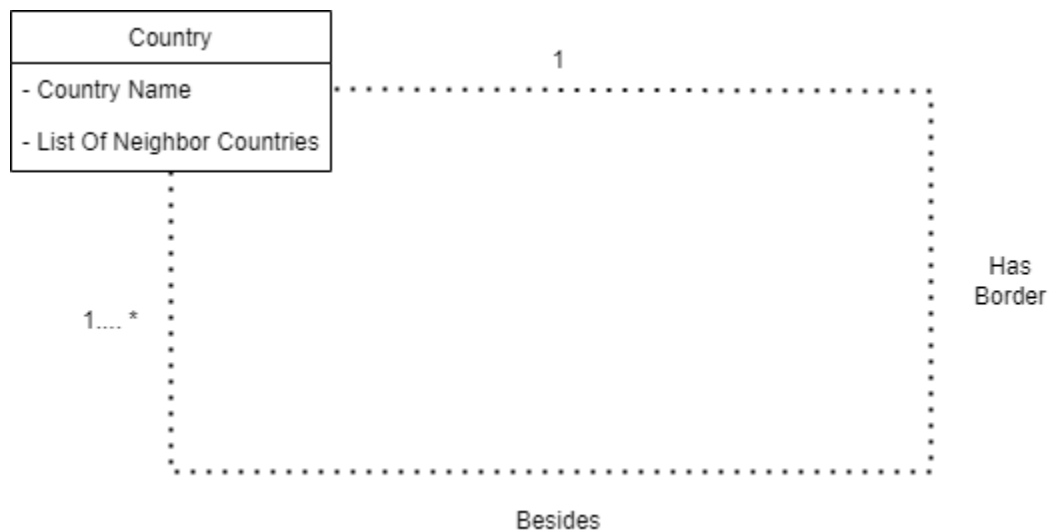# Lab - 04 : Class Modeling

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

(1) Smallest Number of Points Required to Construct a Polygon
- To form a polygon, you need at least 3 points. This is because a polygon is essentially a closed geometric shape with a minimum of three sides.
- The simplest example of a polygon is a triangle, which is defined by exactly 3 points

(2) Sharing Points Between Polygons
- **Shared Points:** When points are shared between polygons, the requirement for the minimum number of points per individual polygon remains unchanged. Each polygon needs a minimum of 3 distinct points to be valid, although these points can be used by multiple polygons.
- **Non-Shared Points:** If points cannot be shared, then each polygon must have its own set of at least 3 separate points.
- **Point Ordering:** Regardless of whether points are shared or not, the points are usually ordered to determine how they connect to form the polygon's edges. For example, a triangle is defined by an ordered sequence of three points.

Polygon	1...*	has	3....*	Points
- Number Of Points				- x-Coordinate
				- y-Coordinate
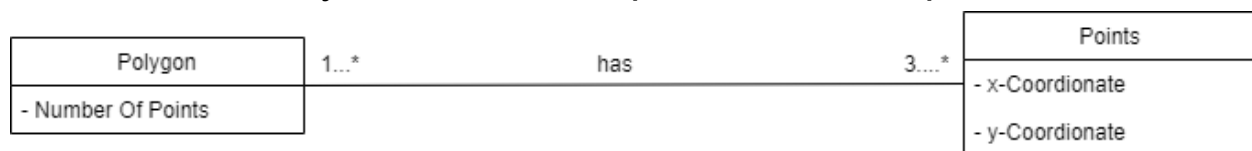
Q.3 Figure 3 is a partially completed class diagram of an air transportation system. Add multiplicities in the diagram. Also add association names to unlevelled associations.

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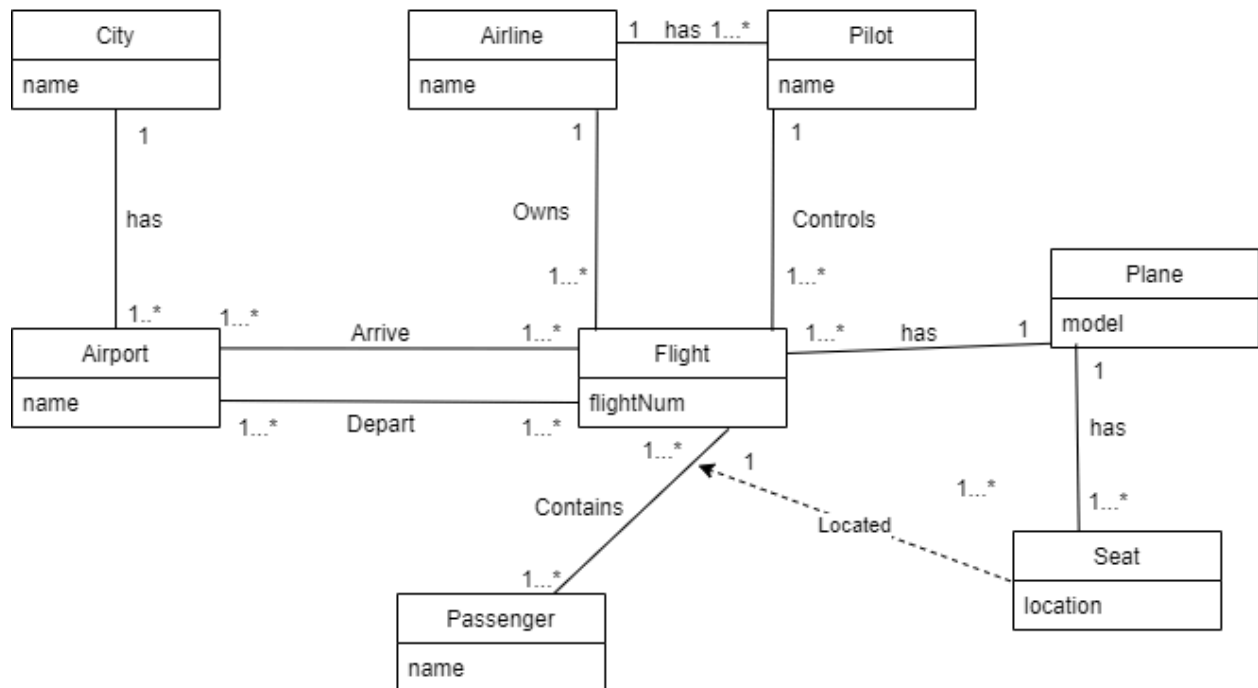
Q.4 We want to model a system for management of flights and pilots. An airline operates flights. Each airline has an ID. Each flight has an ID a departure airport and an arrival airport: an airport as a unique identifier. Each flight has a pilot and a co-pilot, and it uses an aircraft of a certain type;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