

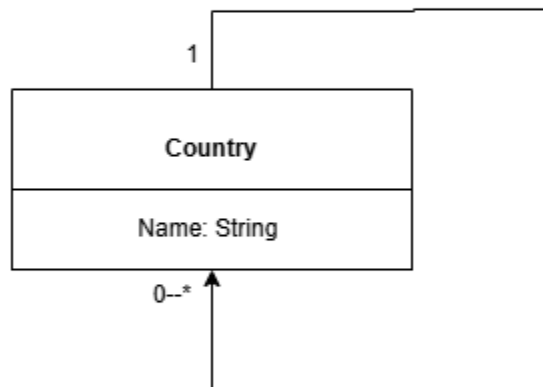
Software Engineering

Lab_4

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



Q.2 Prepare a class diagram for the 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 points may be shared between polygons? Your answer should address the fact that points are ordered.

Sub Question 1: Elaborate on the variety of decisions involved.

Multiplicity Decisions:

A polygon is made up of several points. The minimum number of points required to create a polygon (such as a triangle) is 3.

The connection between a Polygon and its Points is one-to-many. In other words, a single Polygon contains several Points.

A Point can be part of one or multiple Polygons (this can be illustrated using a many-to-many relationship if necessary).

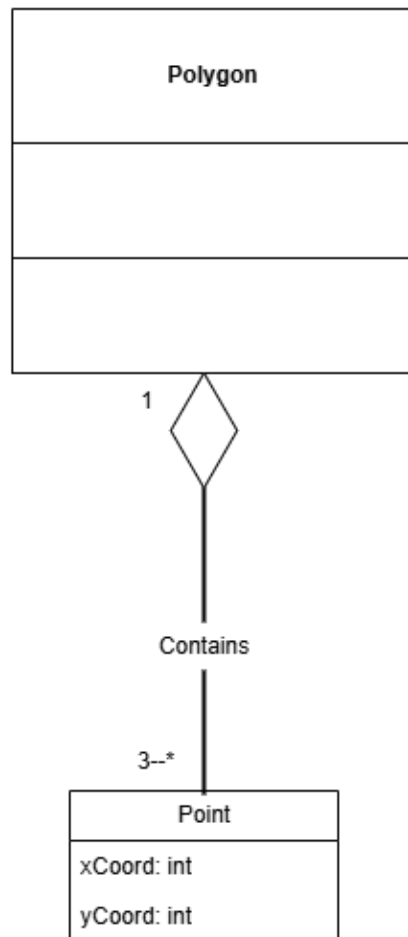
Sub Question 2: What is the least number of points needed to create a polygon?

The least number of points needed to form a polygon is 3 (as seen in a triangle).

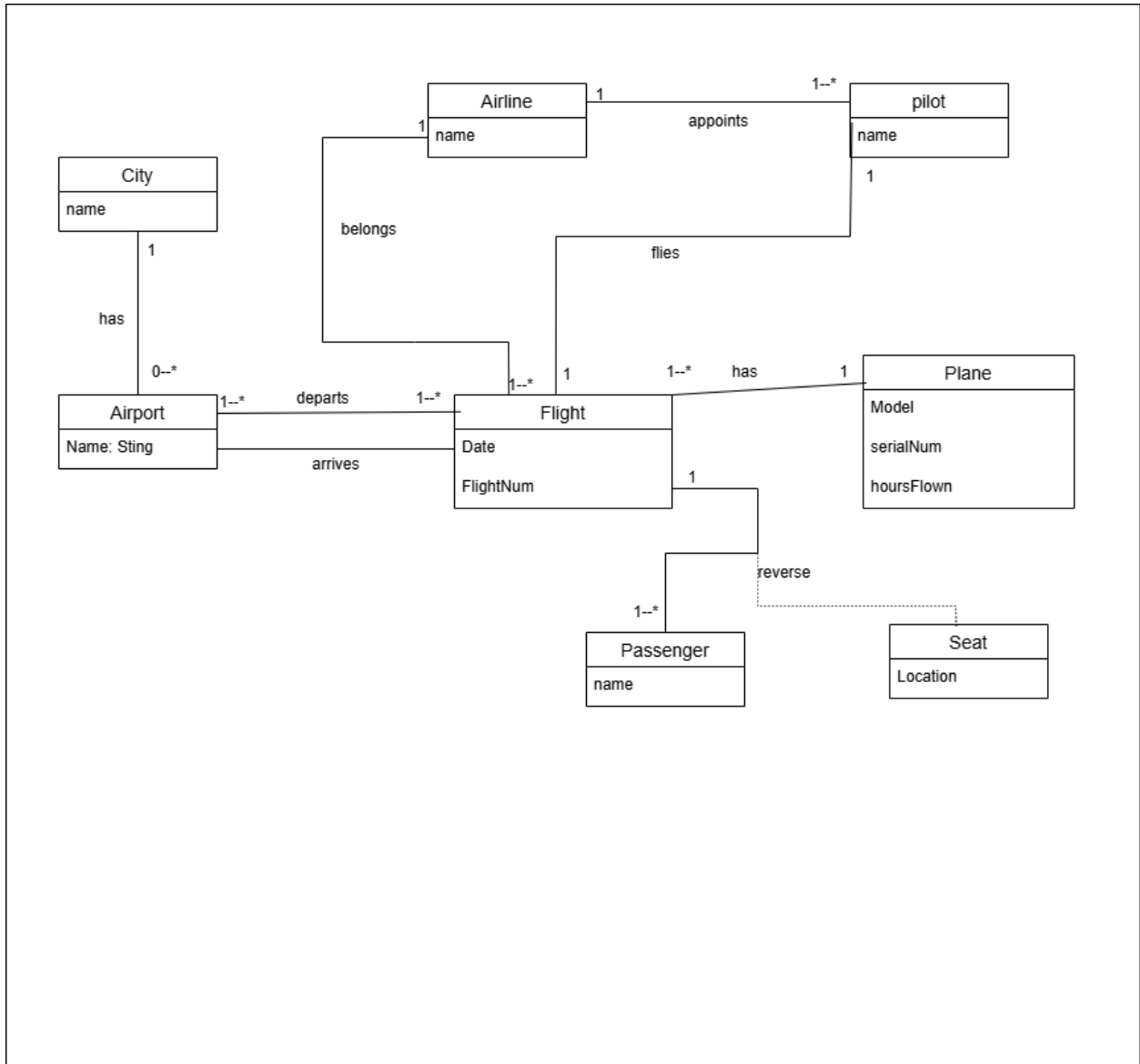
Sub Question 3: Does sharing points between polygons affect the structure?

If points can be shared among polygons, a Point can be linked to multiple polygons, forming a many-to-many relationship between Points and Polygons.

The sequence of points is crucial as it determines the form of the polygon.



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.



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 uniqueidentifier. Each flight has a pilot and a co-pilot, and it uses an aircraft of a certain type; a flight also has 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 airplane 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.

