

Lab 4 - Software Engineering (IT314)

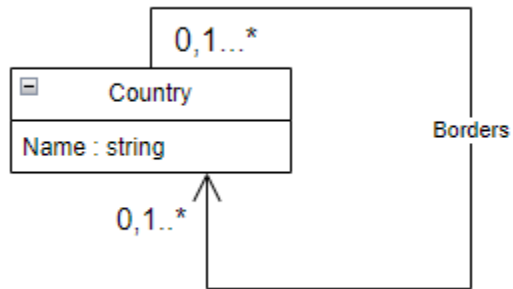
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Question 1: converting given class diagram to object diagram:

Given class diagram:

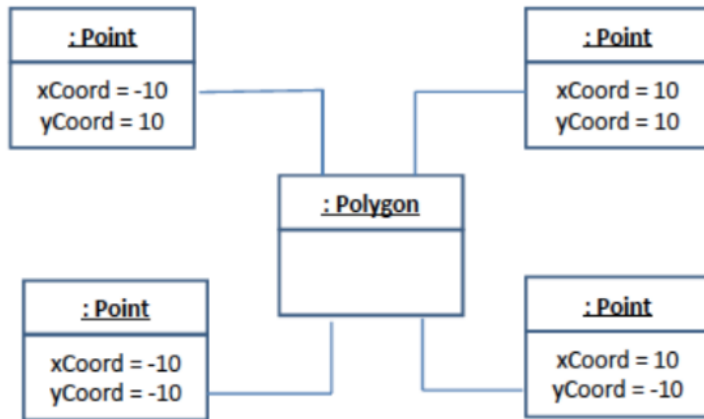


Converted object diagram:

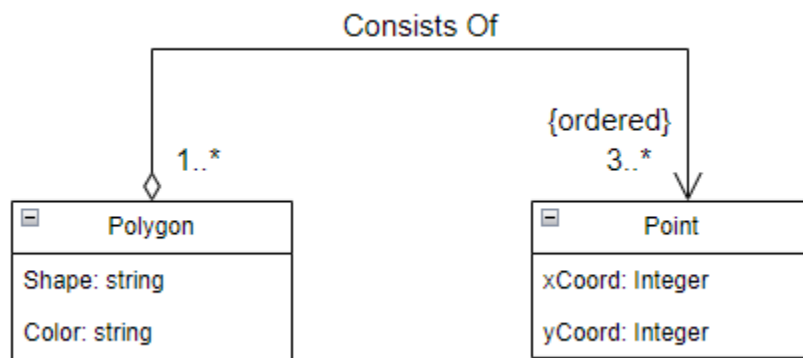


Question 2: Converting object diagram to class diagram. We're also required to explain our choice for multiplicities and explain basic concepts about inheritance in polygons.

Given object diagram:



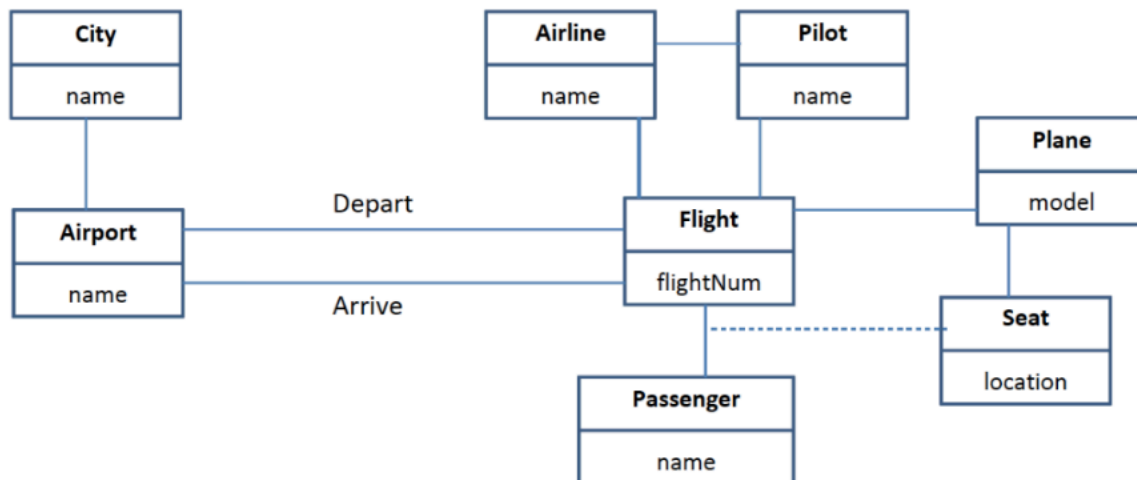
Converted class diagram:



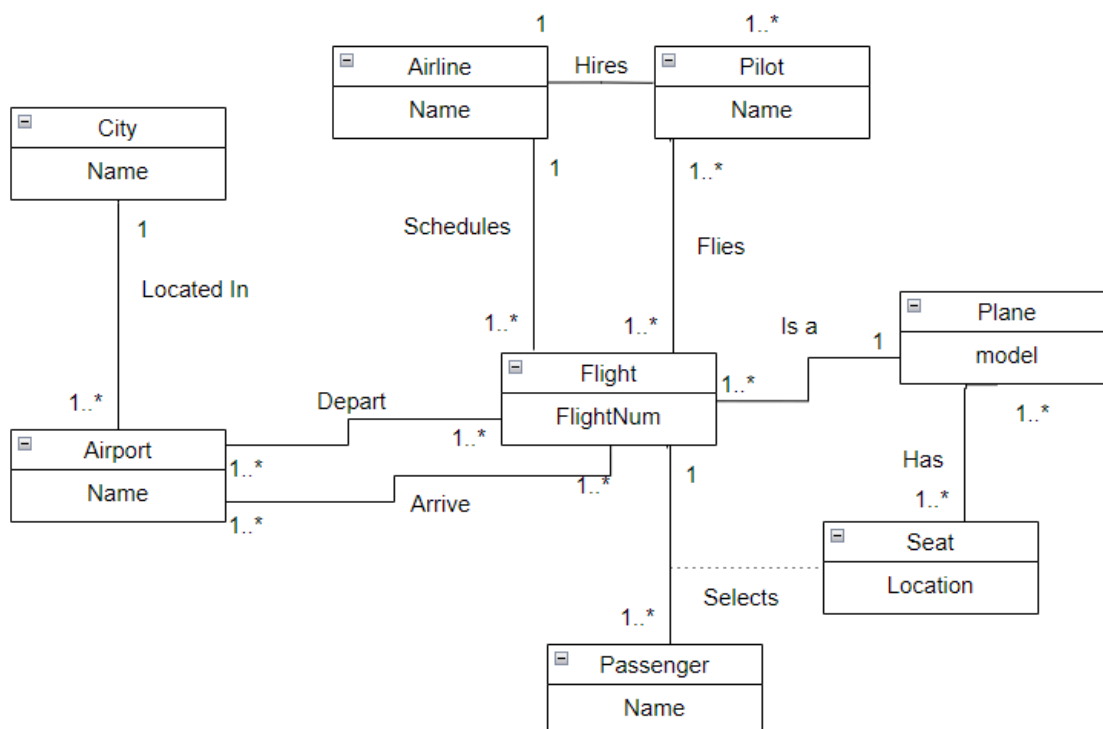
1. Multiplicity: here, a polygon can consist of 3 or more points. Likewise, a point can be part of one or more polygons.
2. A point can be part of multiple polygons because in that case, the polygons will simply be sharing a vertex.
3. We require a minimum of 3 points to form a polygon because the smallest possible polygon is a triangle.

Question 3: We need to add multiplicities and association names to the given class diagram to complete it.

Given class diagram:



Completed class diagram:



Question 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 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.

Constructed class diagram:

