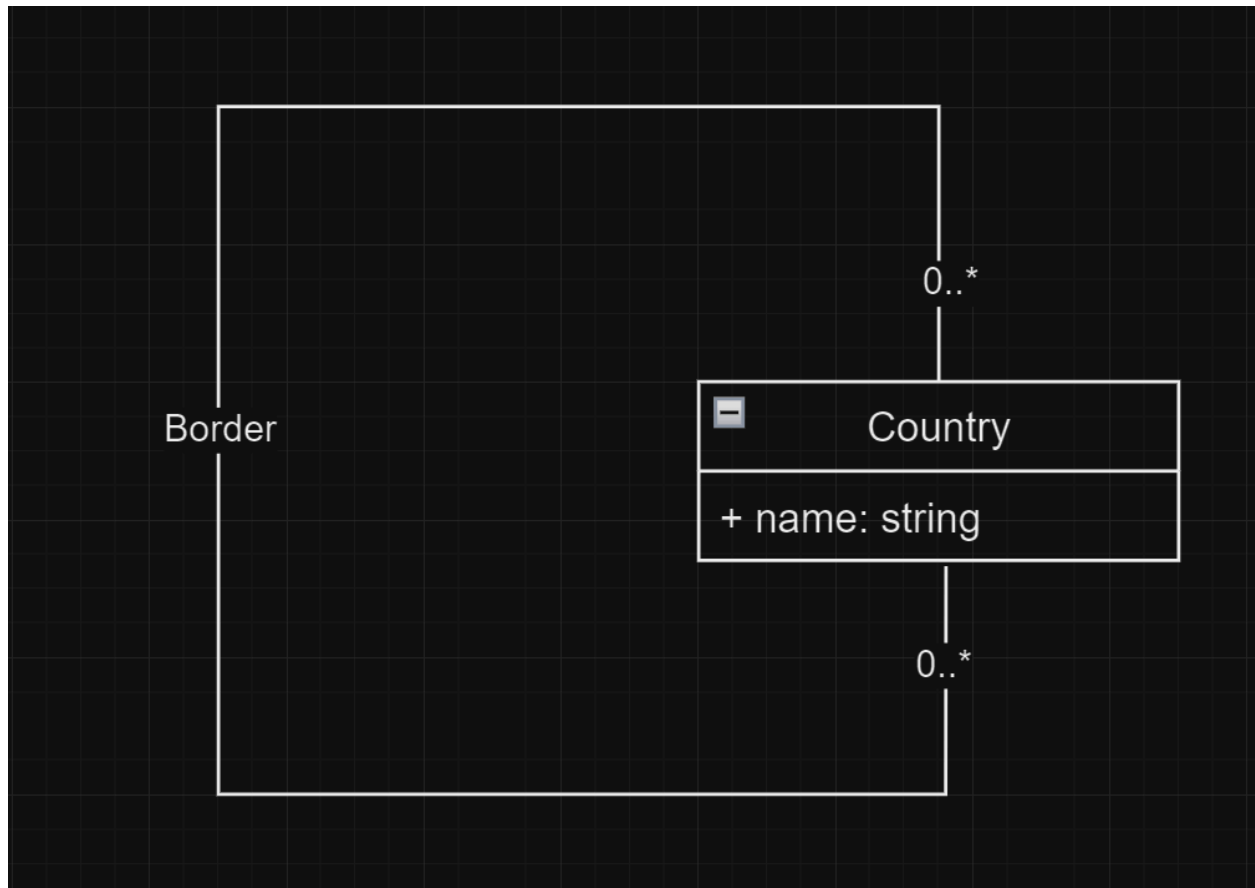
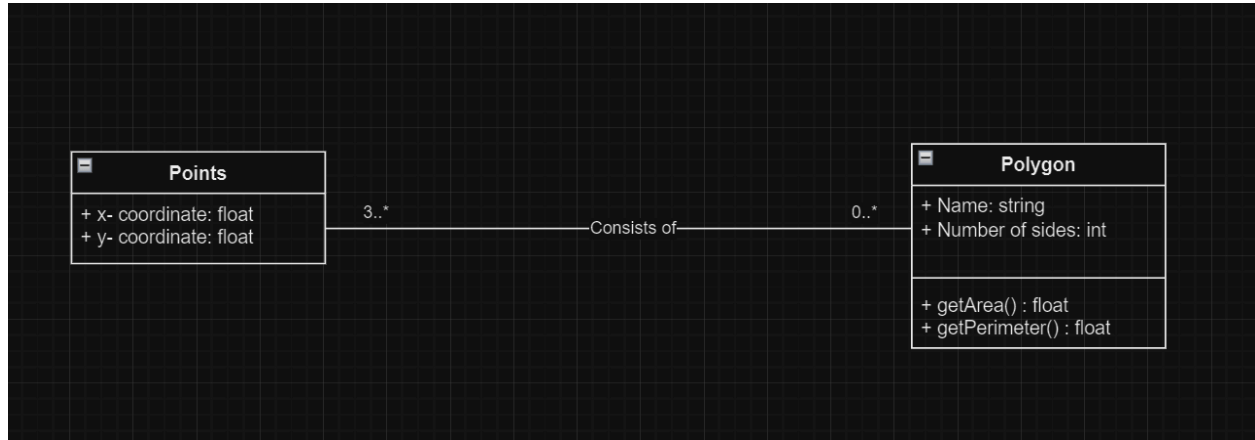


Q1) Prepare a class diagram for the following object diagram that shows a portion of Europe.

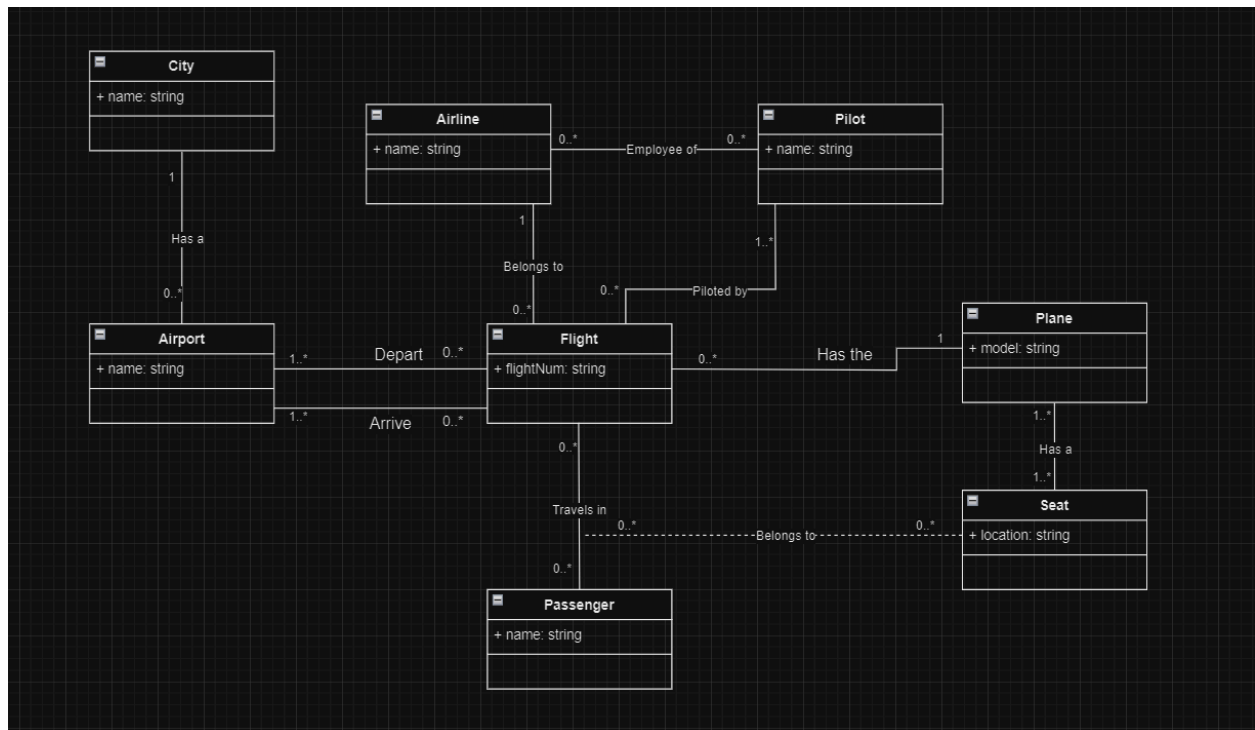


Q2) Prepare a class diagram for the object diagram given in Figure -2. Explain your multiplicity decisions. What is the smallest number of points required to construct a polygon? Does it make a difference whether or not points may be shared between polygons? Your answer should address the fact that points are ordered.



Polygons are made with at least 3 points hence we use `3..*` multiplicity. It does not make a difference whether the points are shared between polygons, minimum 3 are required always. Since a point can or cannot be part of a polygon, `0..*` is specified as multiplicity. Order of points is important here as different orders would construct / denote different polygons.

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.



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 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.

