Software Engineering lab 4

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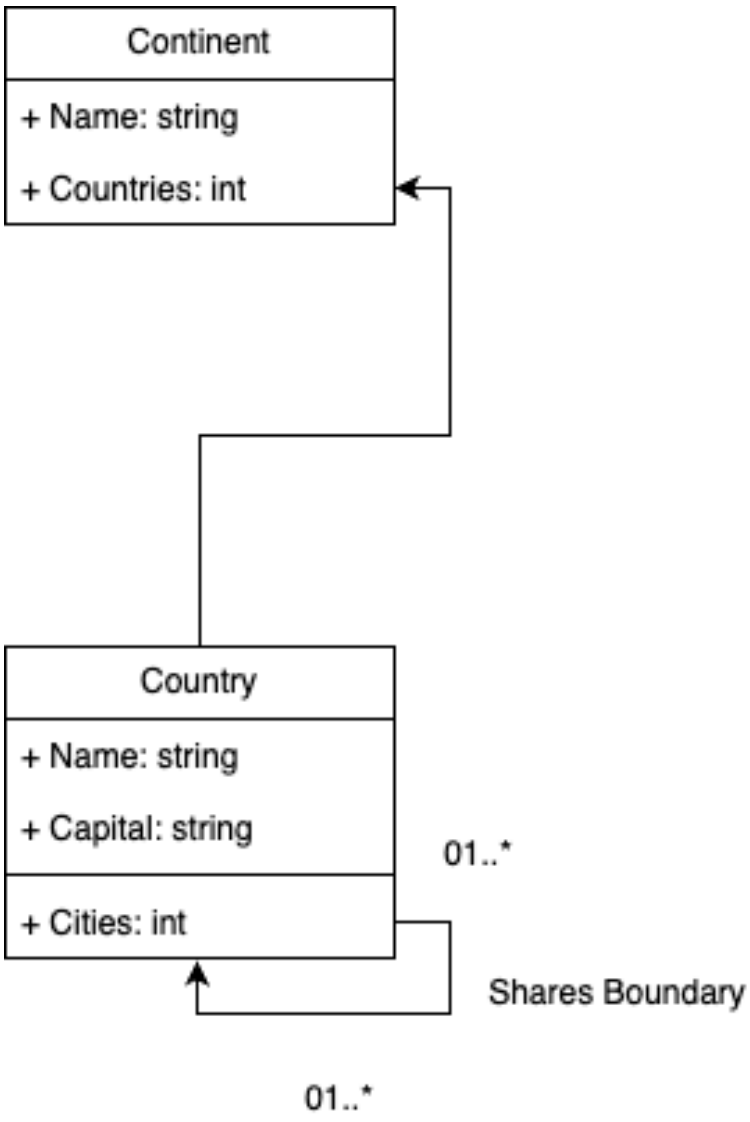
Question:1
Q.1 Prepare a class diagram for the following object diagram that shows a portion of Europe.



Question:2

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 whetherornotpointsmaybesharedbetweenpolygons?Youranswershould address the fact that points are ordered.

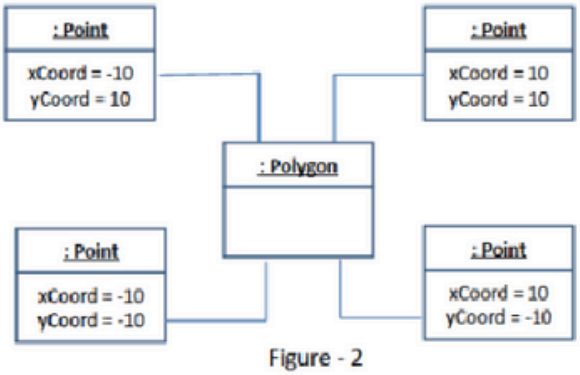
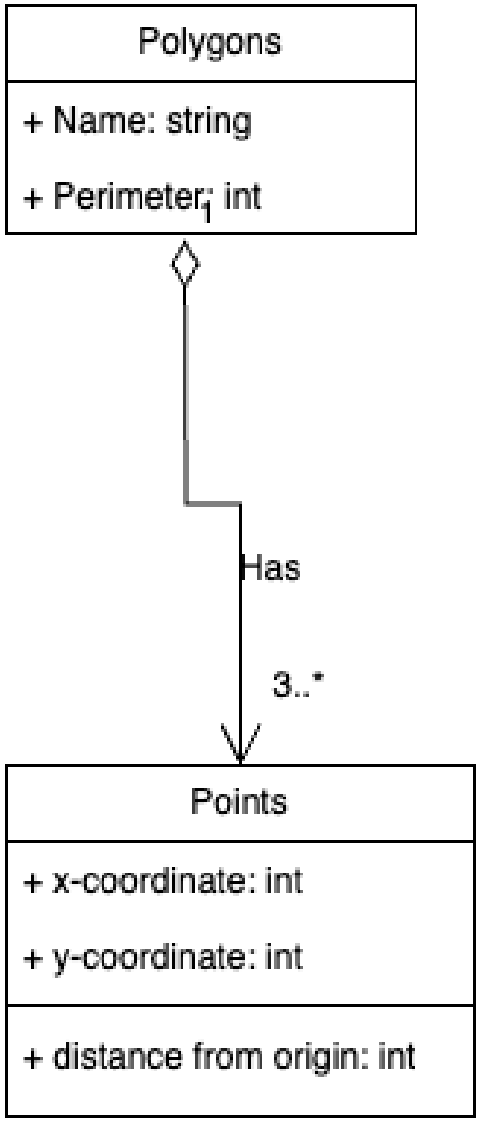
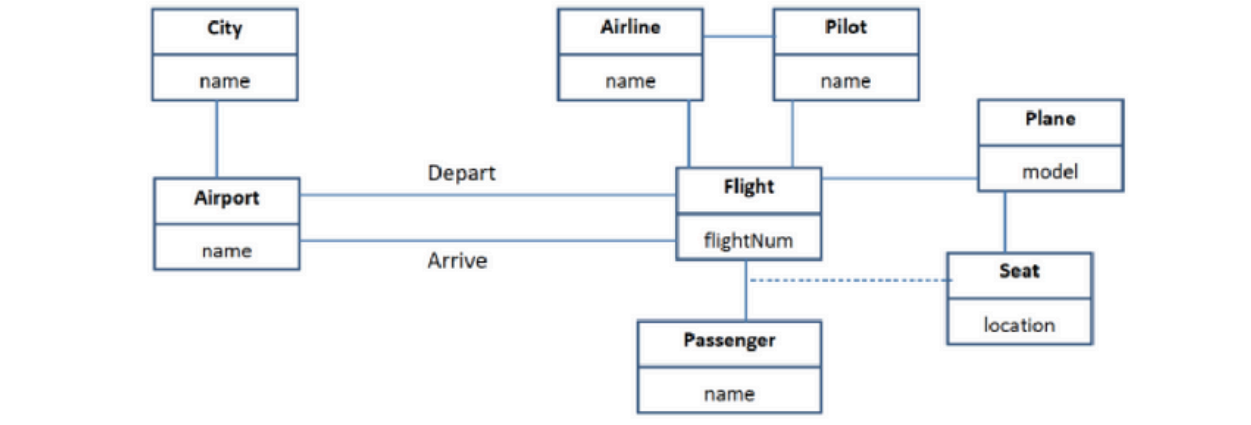


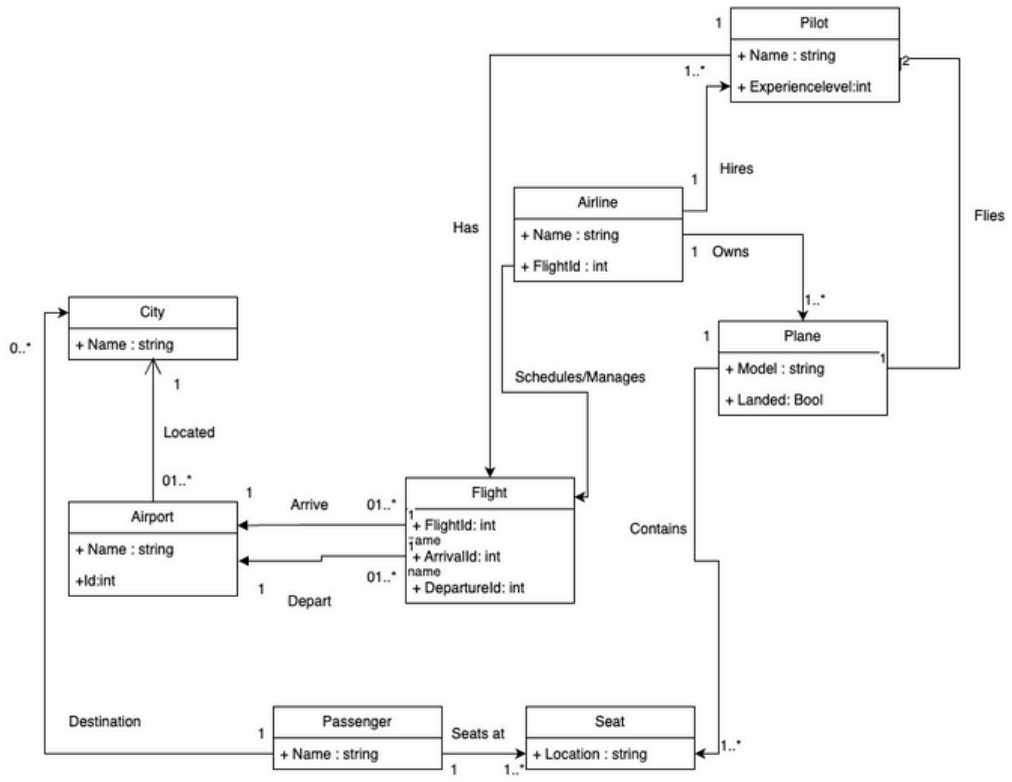
Figure - 2



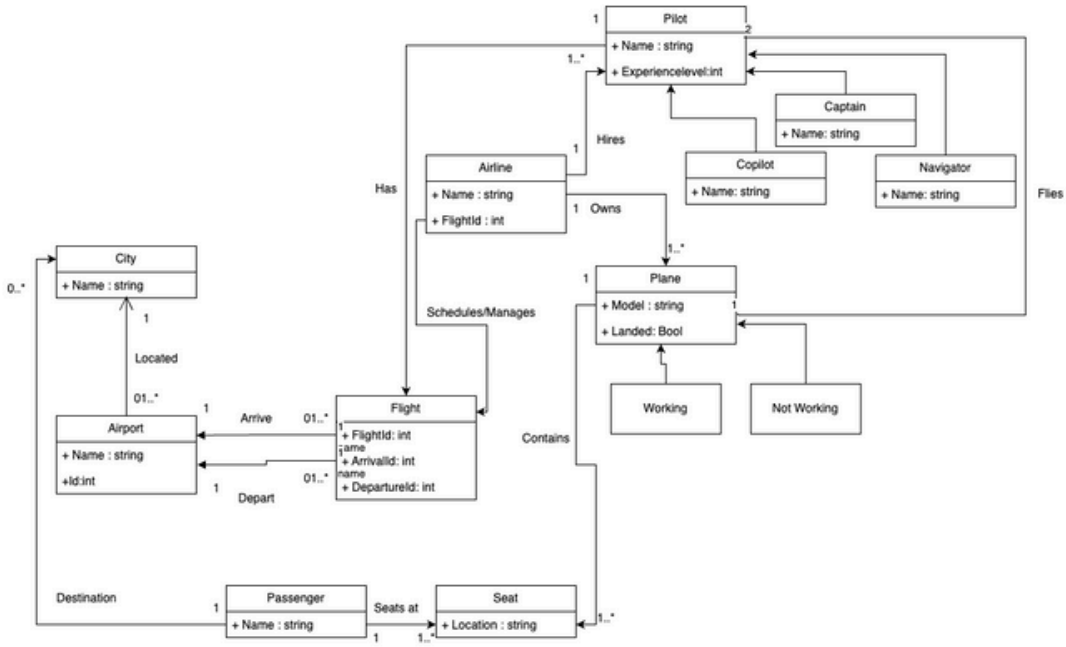
Explanation:
For a polygon to form, it requires a minimum of 3 points. This relationship is captured as Polygon having a "1 to many" (1..*) relationship with Point.
If points can be shared between polygons, then Point will have a "many to many" (0..*) relationship with Polygon.
If points cannot be shared, the multiplicity from Point to Polygon might be 0..1, indicating each point is part of one or no polygon.
The smallest number of points required to construct a polygon is three. This is because a polygon is defined as a closed shape with straight sides, and three sides are the minimum needed to form a closed shape (a triangle).

Question: 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 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.


Pilot
+ Name : string
+ Experiencelevel:int
Captain
+ Name: string
Copilot
+ Name: string
Navigator
+ Name: string
Airline
+ Name : string
+ FlightId : int
Hires
Has
Owns
Flies
City
+ Name : string
Plane
+ Model : string
+ Landed: Bool
Schedules/Manages
Located
Working
Not Working
Airport
+ Name : string
+Id:int
Flight
+ FlightId: int
+ ArrivalId: int
+ DepartureId: int
Arrive
Depart
Contains
Destination
Passenger
+ Name : string
Seats at
Seat
+ Location : string