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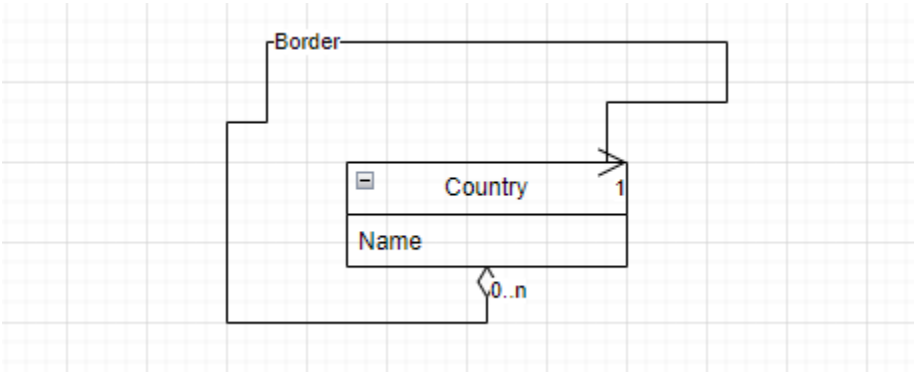
I'd; - 202201501
Lab-4
Software Enginerring

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

Figure-1

Answer: -



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.

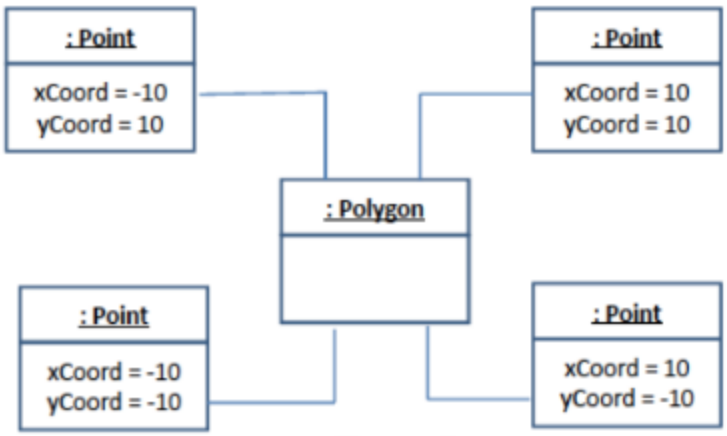
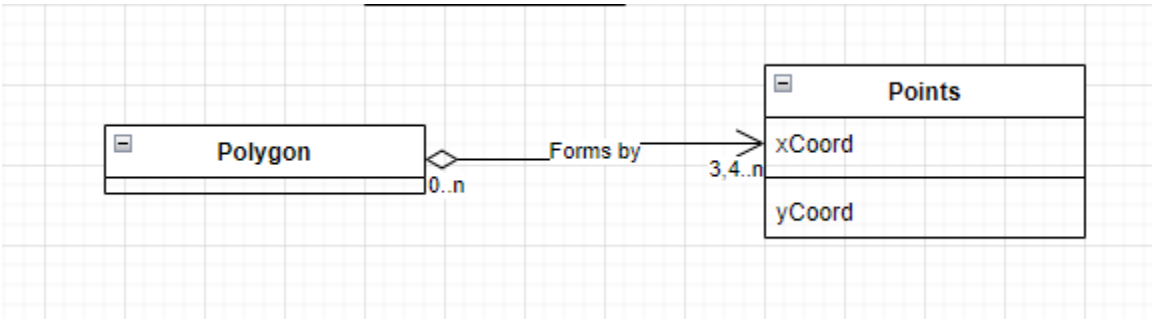
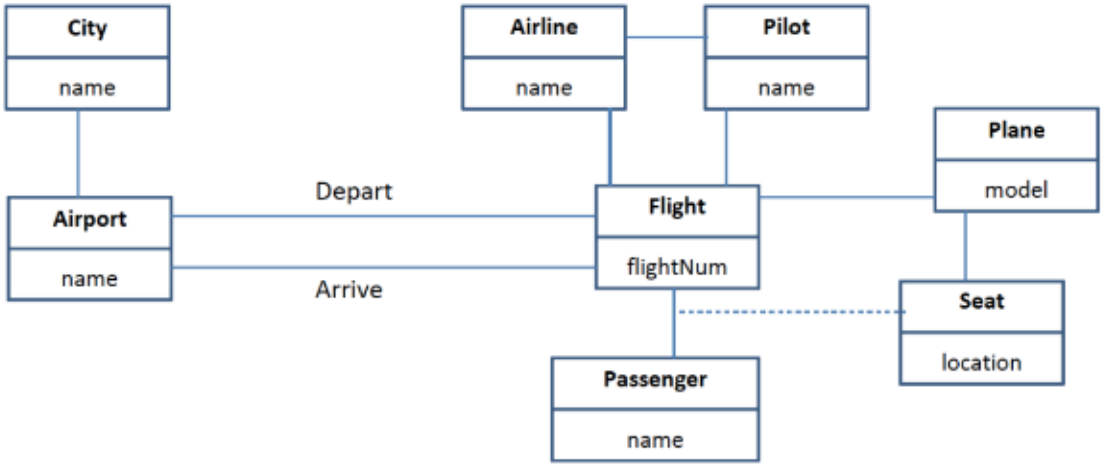


Figure - 2

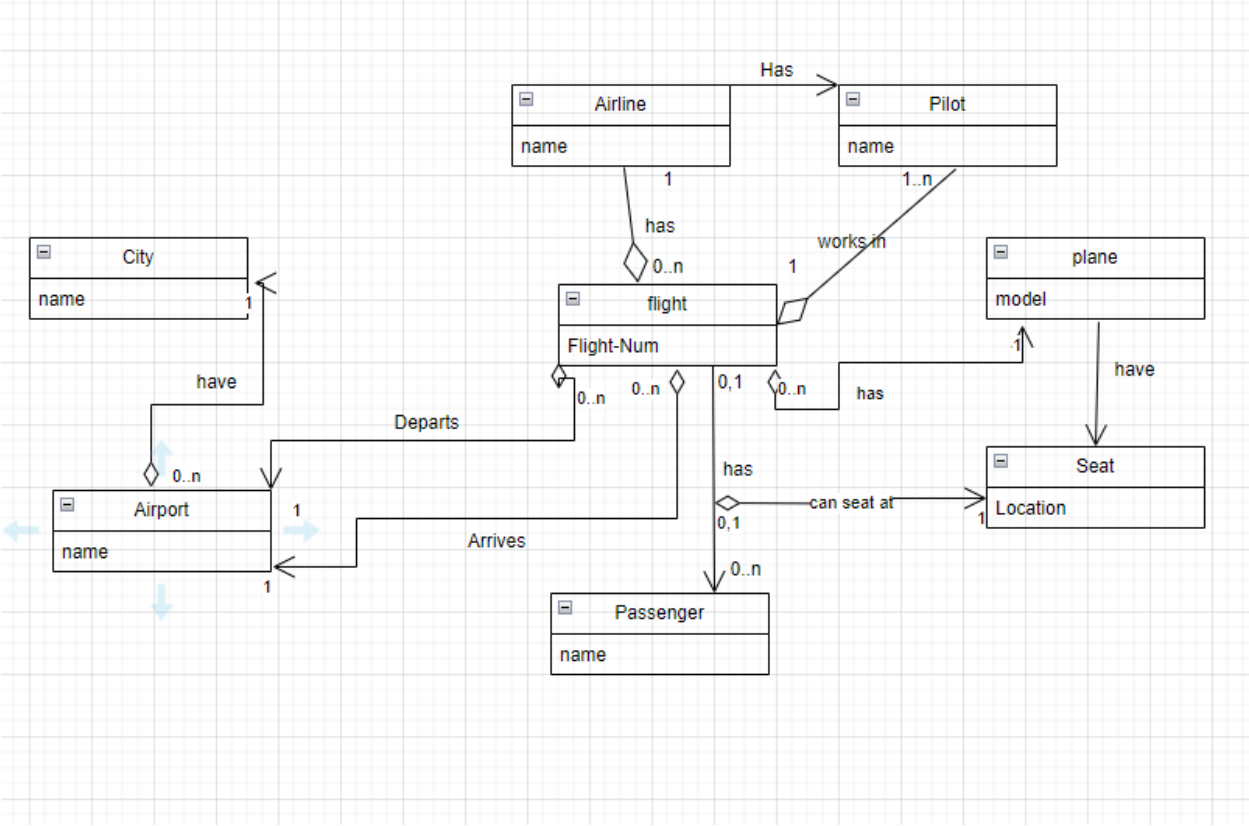
Answer: -



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.

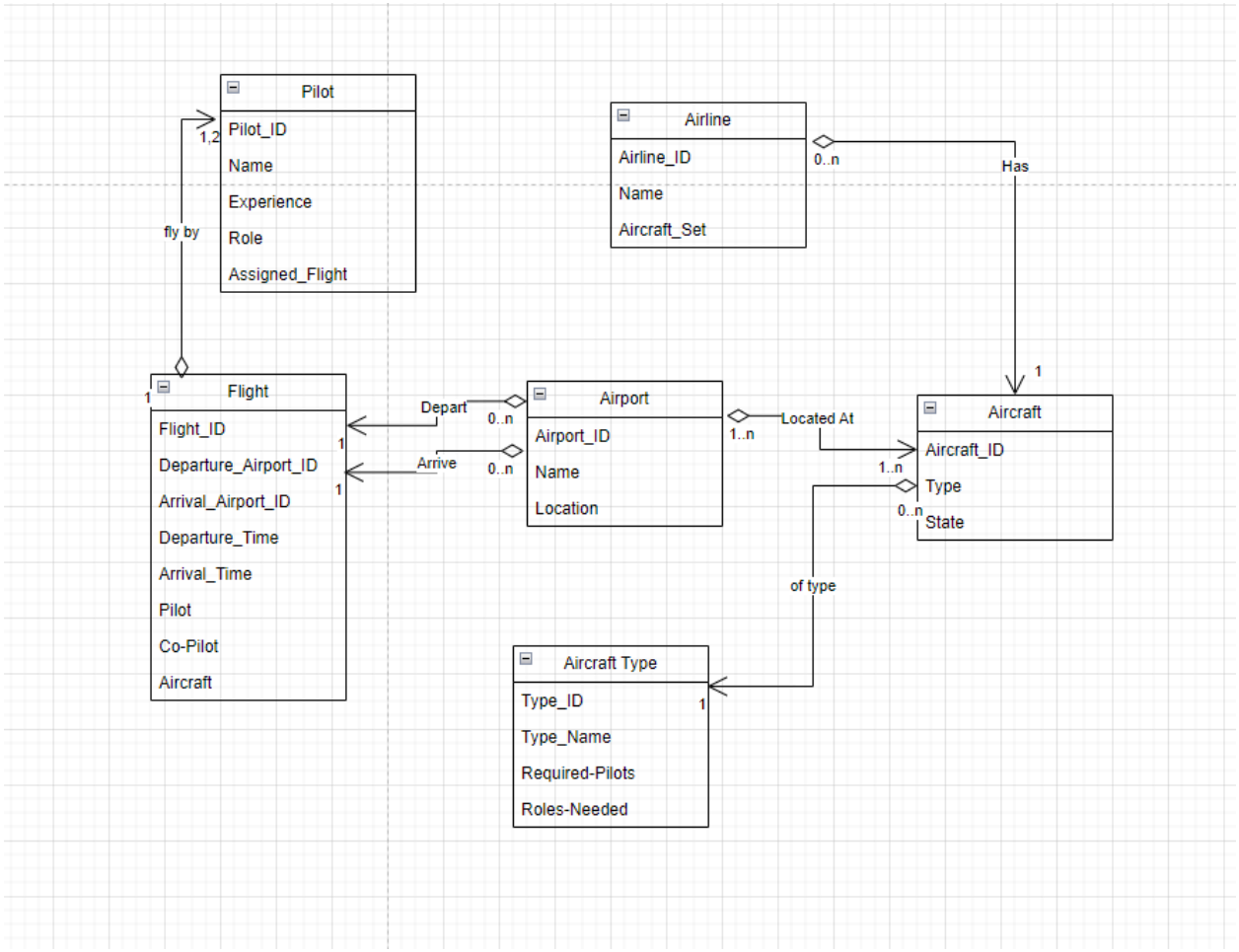


Answer: -



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.

Answer: -


Pilot
Pilot_ID
Name
Experience
Role
Assigned_Flight
1,2
fly by
Airline
Airline_ID
Name
Aircraft_Set
0..n
Has
1
Flight
Flight_ID
Departure_Airport_ID
Arrival_Airport_ID
Departure_Time
Arrival_Time
Pilot
Co-Pilot
Aircraft
1
1
Depart
Arrive
0..n
0..n
Airport
Airport_ID
Name
Location
1..n
Located At
Aircraft
Aircraft_ID
Type
State
1..n
0..n
of type
Aircraft Type
Type_ID
Type_Name
Required-Pilots
Roles-Needed
1