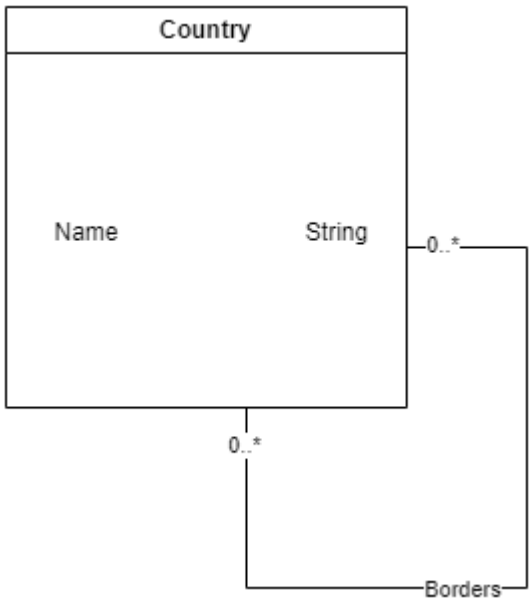
IT314
Software Engineering
Lab-4

Maharshi Raval
202201003

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

Ans)



Q-2) Prepare a class diagram for object diagram given in Figure. 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.

Ans)

Multiplicity Decisions :-

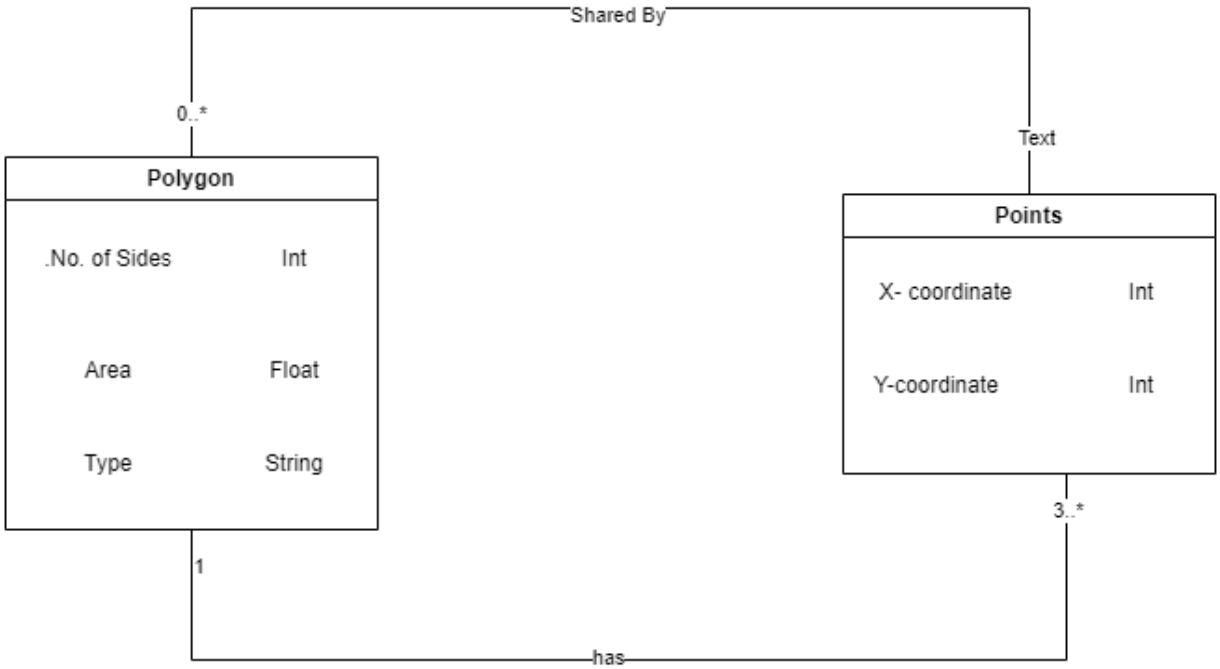
1. Polygon “1” – “3..*” Point : a polygon is made up of at least 3 points.
2. Point “0..*” – “0..” Polygon : a point can belong to zero or no polygons and a polygon can share its points with multiple polygons be it zero or more.

Smallest Number of points to form a polygon is 3.

Does it make a difference whether or not point may be shared between polygons?

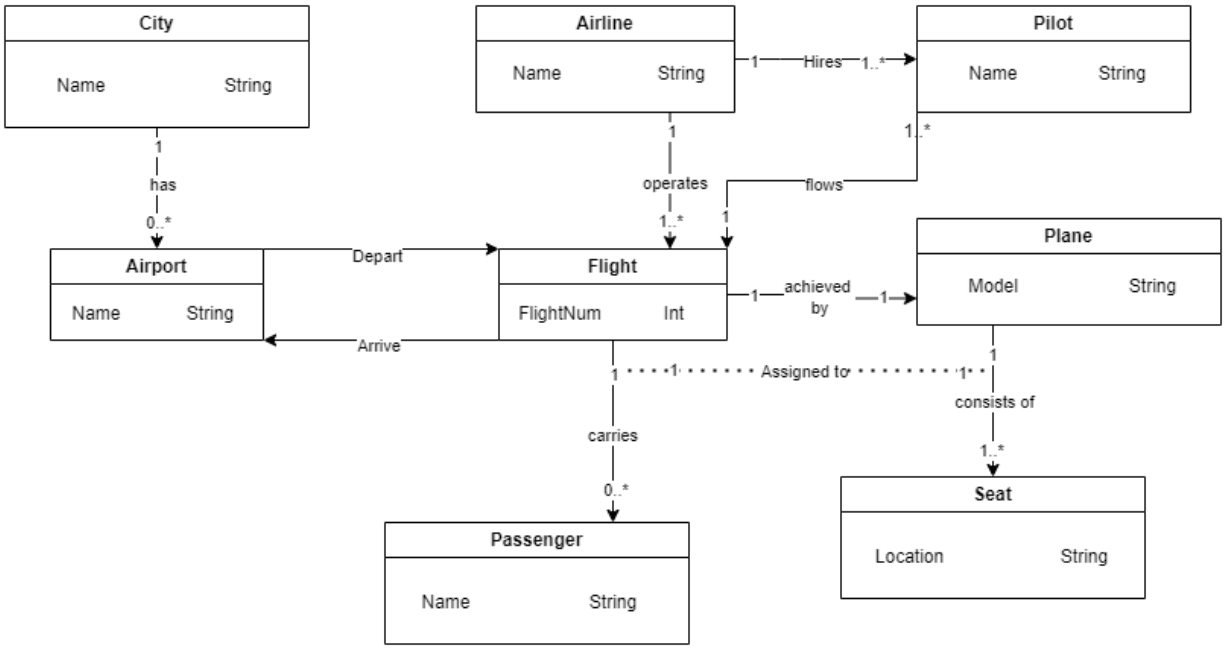
Points can belong to multiple polygons, allowing polygons to intersect or share edges.

Ordered points : in a polygon, the order of the points is crucial because it defines the shape of the polygon.

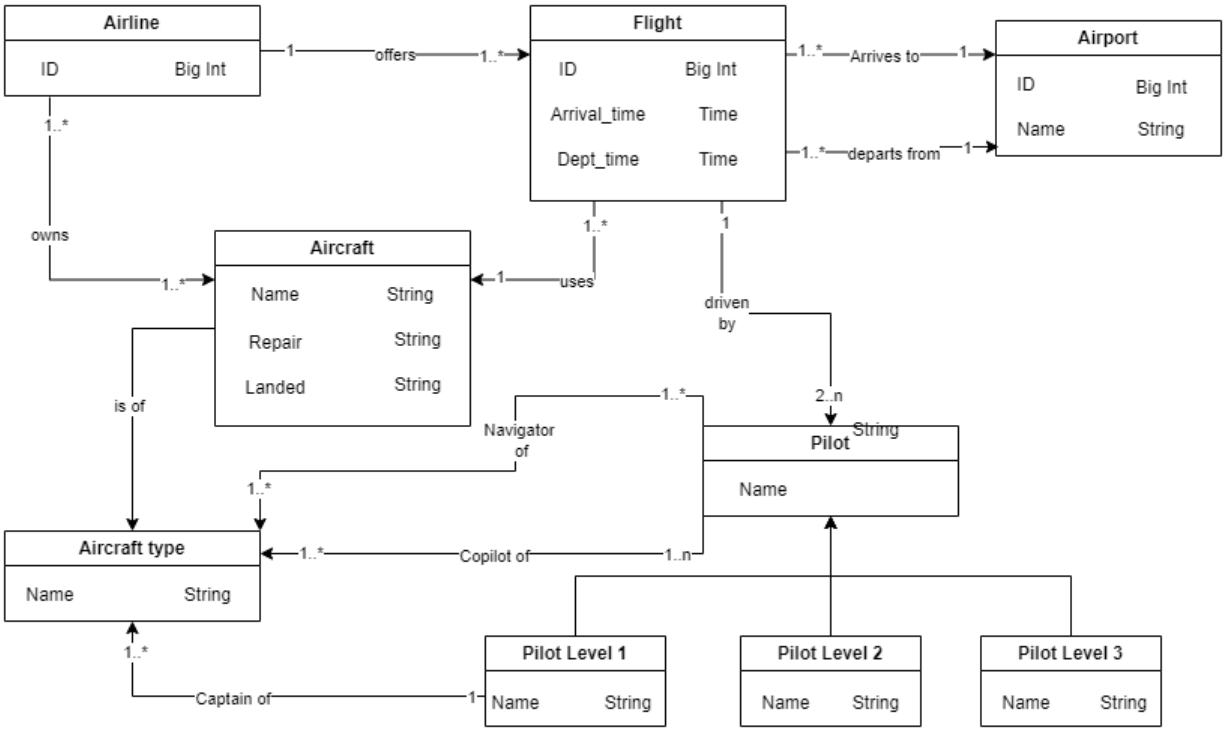


Q-3) Figure 3 is a partially completed class diagram of an air transportation system. Add multiplicities in the diagram. Also add association names to unlevelled associations.

Ans)



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.


Airline
ID Big Int
1
offers
1..*
Flight
ID Big Int
Arrival_time Time
Dept_time Time
1..*
Arrives to
1
Airport
ID Big Int
Name String
1..*
departs from
1
1..*
owns
1..*
Aircraft
Name String
Repair String
Landed String
1
uses
1..*
1
driven by
2..n
is of
1..*
Navigator of
1..*
Pilot String
Name
Aircraft type
Name String
1..*
Copilot of
1..n
1..*
Captain of
1
Pilot Level 1
Name String
Pilot Level 2
Name String
Pilot Level 3
Name String