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

Spain: Country	Borders	France: Country	Borders	Belgium: Country
Name = Spain		Name = France		Name = Belgium

Figure-1

ANS1)

COUNTRY
COUNTRY NAME
getname()

1

Borders

0..*
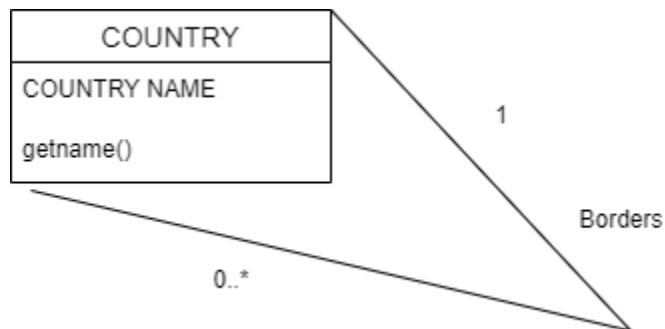
Q2)Prepare a class diagram for object diagram given in Figure -2. Explain your multiplicity decisions.
What is the smallest number of points required to construct a polygon? Does it make a difference
whether or not point may be shared between polygons? Your answer should address the fact that
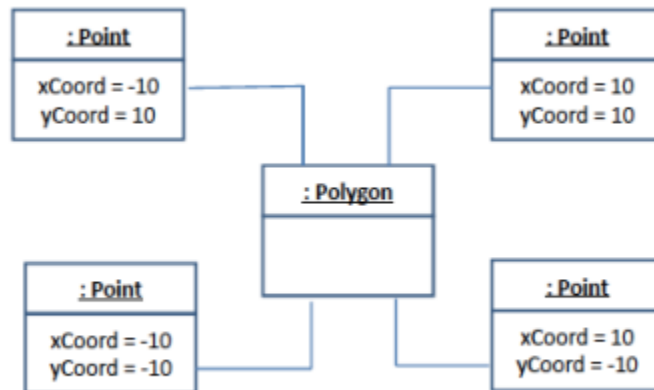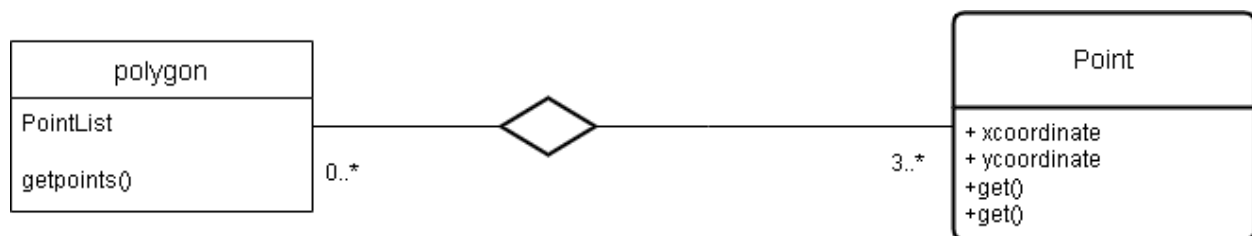points are ordered.

Figure - 2

ANS2)
SMALLEST NUMBER OF POINT REQUIRE TO FORM POLYGON=3..*
SHARING POINTS DOES NOT MAKE DIFF IN MINIMUM POINTS BECAUSE
EACH POLYGON REQ ATLEAST 3..* NON COLINIEAR POINTS TO FORM POLYGON
THE POINTS ARE ORDERD AS HERE WE DO NOT WANT DUPLICATE

As we know that a polygon needs atleast 3..* points ,therefore that explains 3..* multiplicity
It may possible thata point does not belong to any polygon , to appreciate that case,we have set the multiplicity 0.

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.
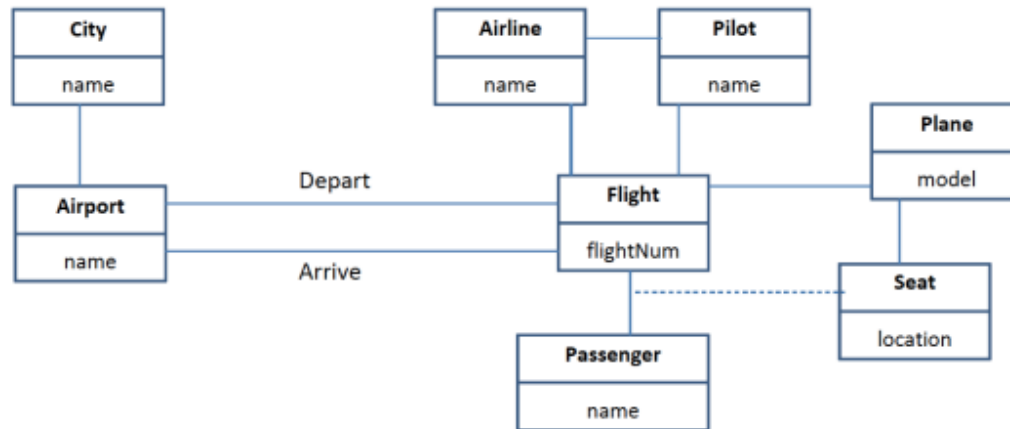
ANS3)
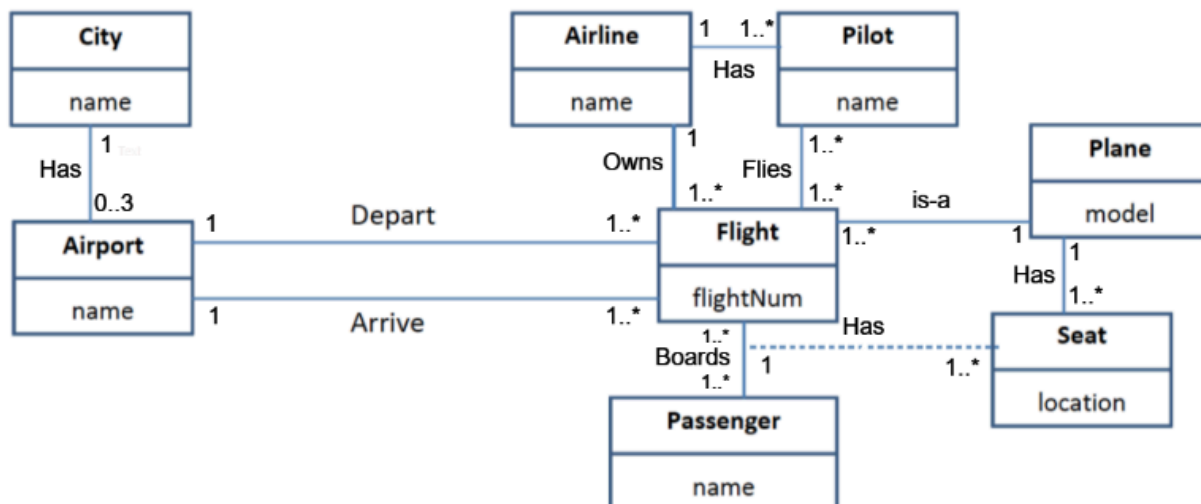
ASSUMPTIONS FOR MULTIPLICITY

WE assume that any city has 0-3..* airports.
We assume that same flight is not operated by same pilot everyday
We assume the possibility that each passenger can have same flight

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.

ANS4)