15/04/2021

COM 2044 Midterm Exam

OBJECT ORIENTED PROGRAMMING

Name:

Number:

Duration: 60 minutes + (10 minutes for uploading)

Q-1: (10 P) Answer the following Concepts OOP concepts by considering JAVA programming languages.

a-) What is abstract class and interface concepts ? Compare them with clear statements! (2p)

b-) **Name and define** four basic specific features of an Object Oriented Programming languages?(4p)

c-) Compare override and overload concepts in OOP using a simple java code example (4p).

Q-2: (10 P) An elevator is described. The following definition is given by the elevator.

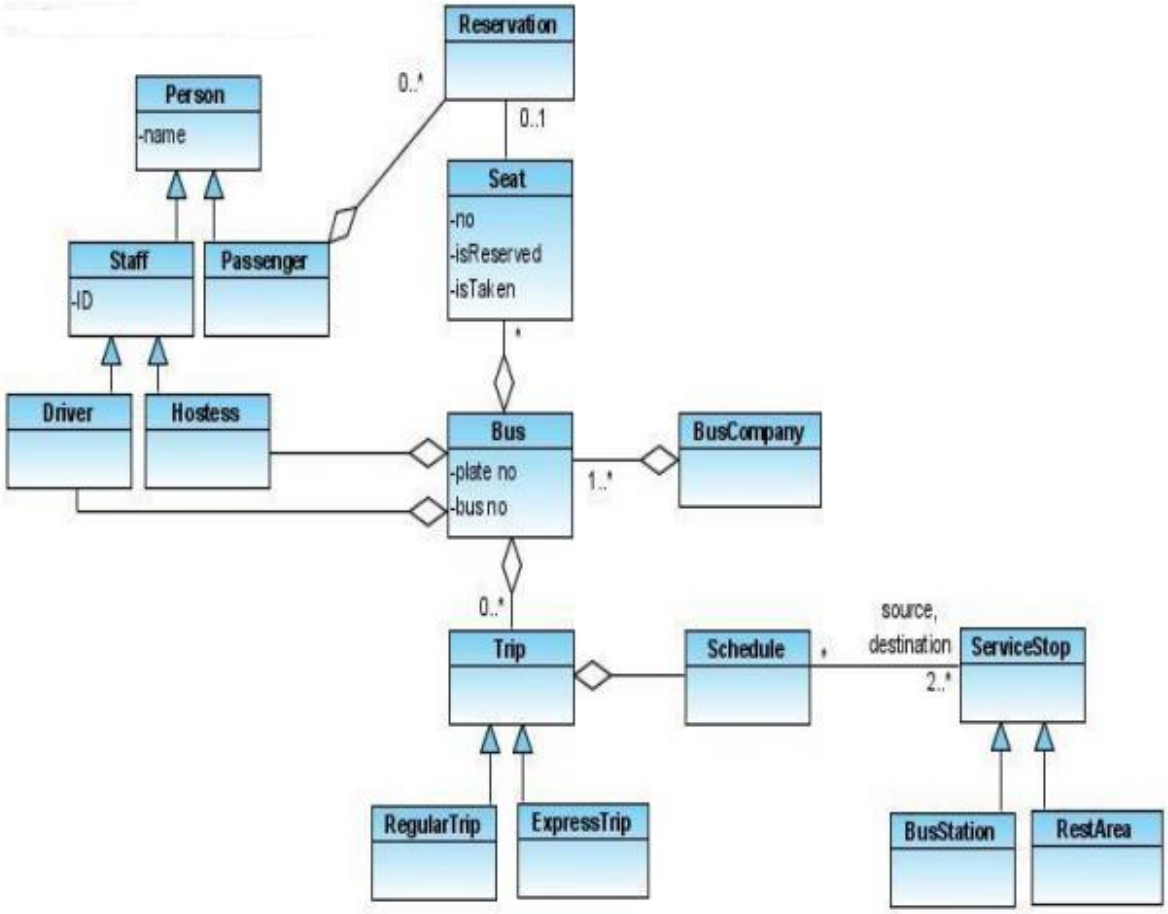
- Each elevator has a set of m buttons, one for each floor. These illuminate when pressed and cause the elevator to visit the corresponding floor. The illumination is canceled when the elevator visits the corresponding floor.
- Each floor, except the first floor and top floor has two buttons, one to request and up-elevator and one to request a down-elevator. These buttons illuminate when pressed. The illumination is canceled when an elevator visits the floor and then moves in the desired direction.
- When an elevator has no requests, it remains at its current floor with its doors closed.

The basic course of Action for elevator scenario:

- Passenger presses floor button (that is the button on the wall).
- Elevator system detects floor button pressed.
- Elevator moves to the floor.
- Elevator doors open.
- Passenger gets in and presses elevator button (that is the button in the cabin panel).
- Elevator doors close.
- Elevator moves to required floor.
- Elevator doors open.
- Passenger gets out.
- Elevator doors close.

It is expected you to draw the Sequence diagram about to the actions involving floor button !!!!

Q-3: (15 P) Convert the given class diagram into Java Code by considering class names, attributes, multiplicities and relations between classes



Q-4: (15 P) Consider the given scenario for enrolling a university and draw a simple USE CASE diagram accordingly.

a. An applicant wants to enroll in the university.
b. The applicant hands a filled out copy of *University Application Form* to the registrar.
c. The registrar clicks on the *Create Student* icon.
d. The system displays *Create Student Screen*.
e. The registrar inputs the name, address, and phone number of the applicant.
f. The system checks whether the applicant is on the applicants list and whether they already exist within the system.
g. If the student is on the applicants list but not already on the system, then a record is created.
h. The student enrolls in courses.
i. The system calculates the required initial payment.
j. The system displays *Fee Summary Screen*.
k. The student pays the initial fee.
l. The system prints a receipt.
m. The registrar validates and gives the student the receipt.
n. The use case ends.