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SINGAPORE UNIVERSITY OF SOCIAL SCIENCES

ICT340
Application Analysis and Design
JAN 2024
ECA

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T-Group	T01
Date Submitted	6 April 2024 Saturday

Answer all questions. (Total 100 marks)

Question 1

Question 1(a)

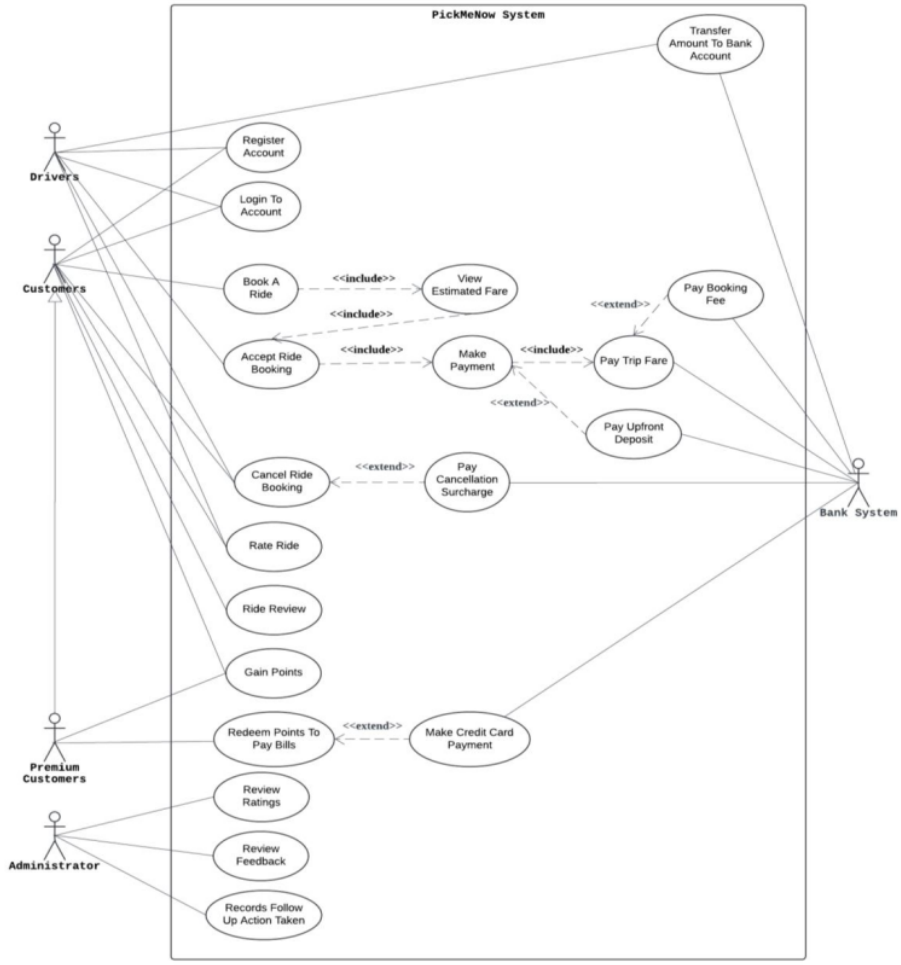
Question 1(a)(i) (5 marks)

ANS:
Primary Actors:
Drivers, Customers, Administrator, Premium Customers (Inherited From Customers)

Supporting Actors:
Bank System

Question 1(a)(ii) (13 marks)

ANS:



Question 1(b) (4 marks)

ANS:
The system design is inconsistent and ambiguous.

1. Inconsistent Cancellation Policy:
It is inconsistent because the requirements excerpt mentions that customers can always cancel without any penalty which contradicts the information in the appendix which stated that customers would be penalized with a $4 surcharge fee for cancelling after 5 minutes of car bookings.

2. Ambiguous Vehicle Selection:
It is ambiguous because the requirements excerpt mentions that customers can choose a destination and wait for a taxi to arrive which is ambiguous because the information in the appendix stated that PickMeNow offers customers 3 different types of vehicles for their ride which are cars, vans and excursion buses. Meanwhile, the requirements excerpt does not clarify if taxi referred to all vehicle types or 1 of the 3 vehicle types that customers can choose from.

Question 2

Question 2(a) (15 marks)

ANS:

1. Class:	User, superclass of Driver, Customer, Premium Customer and Administrator	**Relationship:**
Attributes:	userID	The unique identifier of the user
	name	The name of the user
	contact_number	The contact number of the user
	email_address	The email address of the user

2. Class:	Driver	**Relationship:**
Attributes:	accountNum	The bank account number of the driver
	bank_name	The bank name of the driver

3. Class:	Customer	**Relationship:**
Attributes:	points	The number of points accumulated from the ride
	isPremium	Whether customer is premium or not

4. Class:	Administrator	**Relationship:**
Attributes:	Refer to super class User	

5. Class:	Vehicle, superclass of Car, Van and ExcursionBus	**Relationship:**
Attributes:	licensePlateNumber	The license plate number of the vehicle
	brand	The brand of the vehicle
	model	The model of the vehicle

6. Class:	Car	**Relationship:**
Attributes:	Refer to super class Vehicle	

7. Class:	Van	**Relationship:**
Attributes:	depositAmt	The deposit amount for the vehicle
	bookingFee	The booking fee for the vehicle

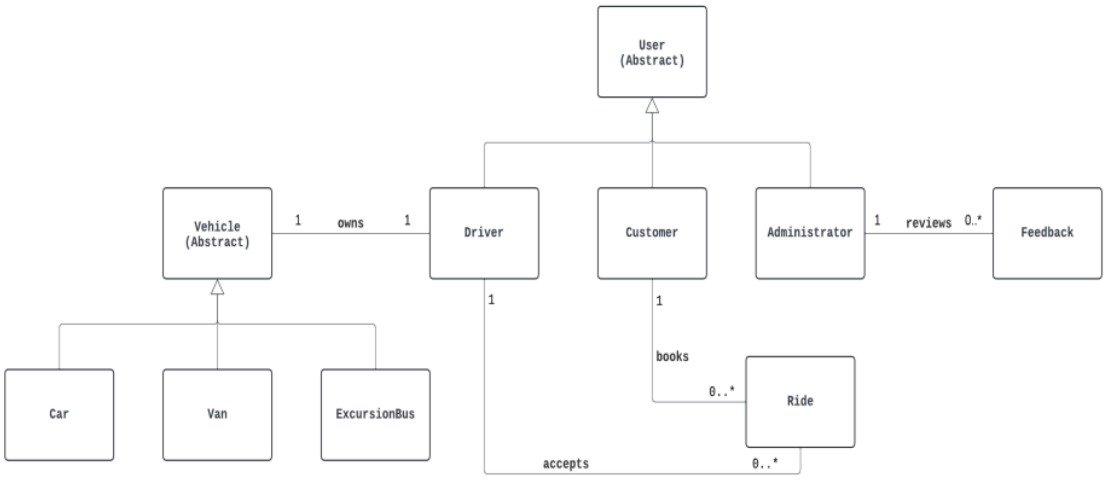
8. Class:	ExcursionBus	**Relationship:**
Attributes:	depositAmt	The deposit amount for the vehicle

9. Class:	Ride	**Relationship:**
Attributes:	referenceNum	The reference number of the ride
	fare	The fare of the ride
	pickUpPoint	The pick up point of the ride
	destination	The destination of the ride
	distance	The distance of the ride
	date	The date of the ride
	startTime	The start time of the ride
	endTime	The end time of the ride

10. Class:	Feedback	**Relationship:**
Attributes:	rating	The rating of the ride
	description	The feedback description of the ride
	followUpAction	The follow up action of the ride

Question 2(b) (15 marks)

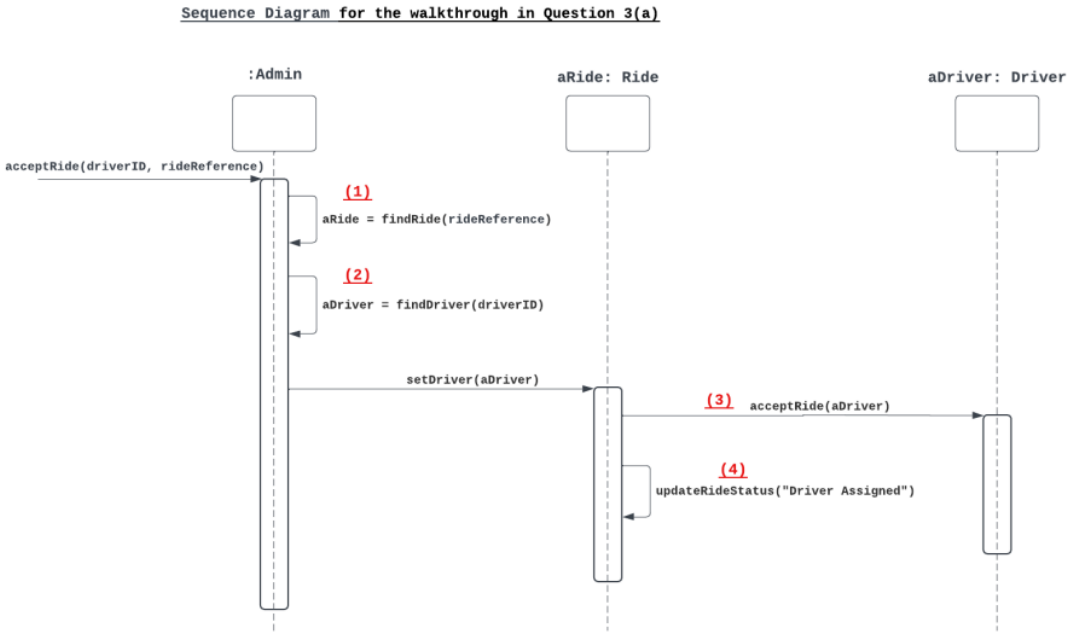
ANS:



Question 3

Question 3(a) (8 marks)

ANS:



Question 3(b)

Question 3(b)(i) (4 marks)

ANS:

```
class OrchestratingClass:
    def __init__(self):
        self.rideDict = {}
        self.driverDict = {}

    def findRide(self, rideReference):
        return self.rideDict.get(rideReference)

    def findDriver(self, driverID):
        return self.driverDict.get(driverID)

    def acceptRide(self, driverID, rideReference):
        aRide = self.findRide(rideReference)
        aDriver = self.findDriver(driverID)
```

```
        return aRide.setDriver(aDriver)
```

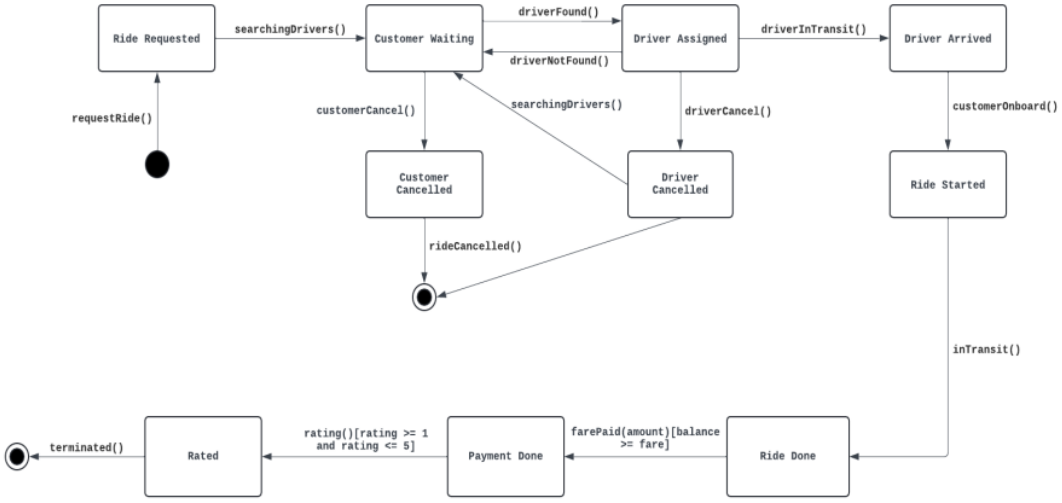
Question 3(b)(ii) (4 marks)

ANS:

```
class Ride:
    def __init__(self, rideReference):
        self._rideReference = rideReference
        self._rideStatus = "Open"
        self._driver = None

    @property
    def updateRideStatus(self):
        return self._rideStatus

    @updateRideStatus.setter
    def updateRideStatus(self, newrideStatus):
        return newrideStatus

    def setDriver(self, driver):
        self._driver = driver
        self._rideStatus = "Driver Assigned"
        return driver.acceptRide()
```

Question 4 (14 marks)

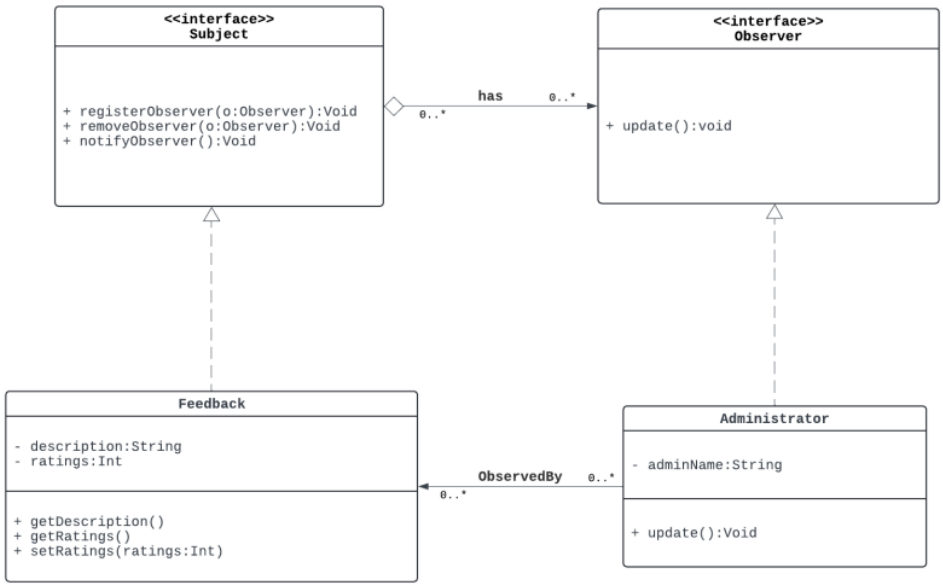
ANS:



Question 5

Question 5(a) (8 marks)

ANS:



Question 5(b) (10 marks)

ANS:

```
class Observer():
    def update(self, subject):
        pass


class Subject:
    def __init__(self):
        self._observers = []

    def registerObserver(self, observer):
        if observer not in self._observers:
            self._observers.append(observer)

    def removeObserver(self, observer):
        try:
            self._observers.remove(observer)
        except ValueError:
            pass

    def notifyObservers(self, modifier = None):
        for observer in self._observers:
            if modifier != observer:
                observer.update(self)




class Feedback(Subject):
    def __init__(self, description):
        Subject.__init__(self)
        self._description = description
        self._ratings = 0

    @property
    def description(self):
        return self._description

    @property
    def ratings(self):
        return self._ratings


    @ratings.setter
    def ratings(self, ratings):
        self._ratings = ratings
        self.notifyObservers()
```

```
class Administrator(Observer):
    def __init__(self, name):
        self._adminName = name

    def update(self, subject):
        print(f"Feedback: {subject.description}, Rating: {subject.ratings}. \n The Administrator {self._adminName}
has been notified of the feedback. \n")


#### Additional Test Results:

def main():
  # Create an administrator
  admin_1 = Administrator("Anson Goh")
  admin_2 = Administrator("Jason Wang")

  # Create some feedback
  feedback1 = Feedback("Great ride!")
  feedback2 = Feedback("Car was dirty")

  # Register the administrator to receive notifications from both feedbacks
  feedback1.registerObserver(admin_1)
  feedback2.registerObserver(admin_2)

  # Set the description and ratings for the feedbacks (This will trigger notification)
#   feedback1.description = "Excellent service by the driver"
  feedback1.ratings = 5
  feedback2.ratings = 3

if __name__ == "__main__":
  main()
```

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