

**Informatics Institute of Technology**

Department of Computing   
(B.Sc.) in Computer Science

**Module: 5COSC007C.1 Object Oriented Programming**

**Coursework 1**

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Table of Contents

[Use case diagram for the console application 3](#_Toc23109101)

[Use case diagram for the GUI application 3](#_Toc23109102)

[Class diagram 4](#_Toc23109103)

[Code 5](#_Toc23109104)

[Vehicle Class 5](#_Toc23109105)

[Car class 6](#_Toc23109106)

[Motorbike class 7](#_Toc23109107)

[Schedule class 8](#_Toc23109108)

[WestminsterRentalManager class 9](#_Toc23109109)

[RentalVehicleManager class 13](#_Toc23109110)

[RentalVehicleSystem class 14](#_Toc23109111)

# Use case diagram for the console application

**A close up of a logo

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# Use case diagram for the GUI application

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# Class diagram

**A screenshot of a cell phone

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# Code

## Vehicle Class

**import** java.math.BigDecimal;  
  
**public abstract class** Vehicle {  
  
 **private** String **vehiclePlateNumber**;  
 **private** String **vehicleMake**;  
 **private** BigDecimal **pricePerKM**;  
  
 **public** Vehicle(String vehiclePlateNumber, String vehicleMake) {  
 **this**.**vehiclePlateNumber** = vehiclePlateNumber;  
 **this**.**vehicleMake** = vehicleMake;  
 }  
  
 **public** Vehicle(String vehiclePlateNumber, String vehicleMake, BigDecimal pricePerKM) {  
 **this**.**vehiclePlateNumber** = vehiclePlateNumber;  
 **this**.**vehicleMake** = vehicleMake;  
 **this**.**pricePerKM** = pricePerKM;  
 }  
  
 **public** String getVehiclePlateNumber() {  
 **return vehiclePlateNumber**;  
 }  
  
 **public void** setVehiclePlateNumber(String vehiclePlateNumber) {  
 **this**.**vehiclePlateNumber** = vehiclePlateNumber;  
 }  
  
 **public** String getVehicleMake() {  
 **return vehicleMake**;  
 }  
  
 **public void** setVehicleMake(String vehicleMake) {  
 **this**.**vehicleMake** = vehicleMake;  
 }  
  
 **public** BigDecimal getPricePerKM() {  
 **return pricePerKM**;  
 }  
  
 **public void** setPricePerKM(BigDecimal pricePerKM) {  
 **this**.**pricePerKM** = pricePerKM;  
 }  
  
 **public abstract** String vehicleType();  
  
 @Override  
 **public** String toString(){  
 **return "Plate number: "** + **this**.**vehiclePlateNumber** + **"Vehicle Make: "** + **this**.**vehicleMake**;  
 }  
}

## Car class

**public class** Car **extends** Vehicle {  
  
 **private int numberOfDoors**;  
 **private** String **fuelType**;  
  
 **public** Car(String vehiclePlateNumber, String vehicleMake, **int** numberOfDoors, String fuelType) {  
 **super**(vehiclePlateNumber, vehicleMake);  
 **this**.**numberOfDoors** = numberOfDoors;  
 **this**.**fuelType** = fuelType;  
 }  
  
 **public int** getNumberOfDoors() {  
 **return numberOfDoors**;  
 }  
  
 **public void** setNumberOfDoors(**int** numberOfDoors) {  
 **this**.**numberOfDoors** = numberOfDoors;  
 }  
  
 **public** String getFuelType() {  
 **return fuelType**;  
 }  
  
 **public void** setFuelType(String fuelType) {  
 **this**.**fuelType** = fuelType;  
 }  
  
 **public** String vehicleType(){  
 **return "Car"**;  
 }  
  
 @Override  
 **public** String toString(){  
 **return super**.toString()+ **"Number of Doors: "** + **this**.**numberOfDoors** + **"\n"** +  
 **"Fuel type: "** + **this**.**fuelType**;  
 }  
}

## Motorbike class

**public class** Motorbike **extends** Vehicle {  
  
 **private int numberOfHelmets**;  
 **private double helmetSize**;  
  
 **public** Motorbike(String vehiclePlateNumber, String vehicleMake, **int** numberOfHelmets, **double** helmetSize) {  
 **super**(vehiclePlateNumber, vehicleMake);  
 **this**.**numberOfHelmets** = numberOfHelmets;  
 **this**.**helmetSize** = helmetSize;  
 }  
  
 **public int** getNumberOfHelmets() {  
 **return numberOfHelmets**;  
 }  
  
 **public void** setNumberOfHelmets(**int** numberOfHelmets) {  
 **this**.**numberOfHelmets** = numberOfHelmets;  
 }  
  
 **public double** getHelmetSize() {  
 **return helmetSize**;  
 }  
  
 **public void** setHelmetSize(**double** helmetSize) {  
 **this**.**helmetSize** = helmetSize;  
 }  
  
 **public** String vehicleType(){  
 **return "Bike"**;  
 }  
  
 @Override  
 **public** String toString(){  
 **return super**.toString()+**"Number of helmets: "** + **this**.**numberOfHelmets**+ **", Helmet Size: "** + **this**.**helmetSize**;  
 }  
  
  
}

## Schedule class

**import** java.util.Date;  
  
**public class** Schedule {  
 **private** Date **pickUpDate**;  
 **private** Date **DropOffDate**;  
  
 **public** Date getPickUpDate() {  
 **return pickUpDate**;  
 }  
  
 **public void** setPickUpDate(Date pickUpDate) {  
 **this**.**pickUpDate** = pickUpDate;  
 }  
  
 **public** Date getDropOffDate() {  
 **return DropOffDate**;  
 }  
  
 **public void** setDropOffDate(Date dropOffDate) {  
 **DropOffDate** = dropOffDate;  
 }  
  
  
 @Override  
 **public** String toString(){  
 **return super**.toString()+**"Pickup Date: "** + **this**.**pickUpDate**+ **", Drop off date: "** + **this**.**DropOffDate**;  
 }  
}

## WestminsterRentalManager class

**import** java.util.ArrayList;  
**import** java.util.Scanner;  
  
**public class** WestminsterRentalManager **implements** RentalVehicleManager{  
  
 **public** ArrayList<Vehicle> **listOfVehicles**;  
  
 **public** WestminsterRentalManager(){  
 **listOfVehicles** = **new** ArrayList<Vehicle>();  
 }  
  
 **public void** addVehicle (Vehicle vehicle){  
 **if**(**listOfVehicles**.size()<***numberOfVehicles***){  
 **listOfVehicles**.add(vehicle);  
 }**else** {  
 System.***out***.println(**"No More Parking!!"**);  
 }  
 }  
  
 *//adding vehicle method* @Override  
 **public void** addVehicle(){  
  
 Scanner scanner = **new** Scanner(System.***in***);  
  
 *//Checking if the space if available* System.***out***.print(**"\n"** +  
 **"Select vehicle type"** +  
 **"\n"** +  
 **"1. Car \n"** +  
 **"2. Motorbike \n"** +  
 **"Choose: "**);  
 **while** (!scanner.hasNextInt()){  
 System.***out***.println(**"Invalid Data Type!!!"**);  
 scanner.next();  
 System.***out***.print(**"Select vehicle type"** +  
 **"\n"** +  
 **"1. Car \n"** +  
 **"2. Motorbike \n"**+  
 **"Choose: "**);  
 }  
 **int** optionVehicle = scanner.nextInt();  
  
 **if** (optionVehicle==1){  
  
 Scanner carOptionScanner = **new** Scanner(System.***in***);  
  
 *//Input car plate number* System.***out***.print(**"Please enter the plate number: "**);  
 String carPlateNumber = carOptionScanner.nextLine();  
  
 *//Input car make* System.***out***.print(**"Please enter the make: "**);  
 String carMake = carOptionScanner.nextLine();  
  
 *//Input number of car doors* System.***out***.print(**"Please Enter the number of doors: "**);  
 **while** (!carOptionScanner.hasNextInt()){  
 System.***out***.println(**"Invalid Data Type !!!"**);  
 carOptionScanner.nextLine();  
 System.***out***.print(**"Please enter the number of doors: "**);  
 }  
 **int** numberOfCarDoors = carOptionScanner.nextInt();  
 carOptionScanner.nextLine();  
  
 *//Input the fuel type* System.***out***.print(**"Please enter the fuel type: "**);  
*// while(!(carOptionScanner.equals("95") || carOptionScanner.equals("92"))){  
// System.out.println("Insert the correct fuel type!!!");  
// carOptionScanner.next();  
// System.out.print("Please enter the fuel type: ");  
// }* String carFuelType = carOptionScanner.nextLine();  
  
 Car car = **new** Car(carPlateNumber, carMake, numberOfCarDoors, carFuelType);  
 addVehicle(car);  
 }  
  
 **else if**(optionVehicle==2){  
 Scanner motorbikeOptionScanner = **new** Scanner(System.***in***);  
  
 *//Input bike number plate* System.***out***.print(**"Please enter plate number: "**);  
 String motorbikeNumber = motorbikeOptionScanner.nextLine();  
  
 *//Input bike make* System.***out***.print(**"Please enter make: "**);  
 String motorbikeMake = motorbikeOptionScanner.nextLine();  
  
 *//Input the number of helmets* System.***out***.print(**"Please enter the number of helmets: "**);  
 **while** (!motorbikeOptionScanner.hasNextInt()){  
 System.***out***.println(**"Invalid Data type"**);  
 motorbikeOptionScanner.next();  
 System.***out***.print(**"Please enter the number of helmets: "**);  
 }  
 **int** bikeNumberOfHelmets = motorbikeOptionScanner.nextInt();  
  
 *//Input the helmet size* System.***out***.print(**"Please enter the helmet size: "**);  
 **while** (!motorbikeOptionScanner.hasNextDouble()){  
 System.***out***.println(**"Invalid Data type"**);  
 motorbikeOptionScanner.next();  
 System.***out***.print(**"Please enter the helmet size: "**);  
 }  
 **double** bikeHelmetSize = motorbikeOptionScanner.nextDouble();  
  
 Motorbike motorbike = **new** Motorbike(motorbikeNumber, motorbikeMake, bikeNumberOfHelmets, bikeHelmetSize);  
 addVehicle(motorbike);  
 }  
 **else** {  
 System.***out***.println(**"Invalid vehicle option!!! "**);  
 }  
  
 }  
  
 @Override  
 **public void** deleteVehicle() {  
 Scanner deleteVehicleScanner = **new** Scanner(System.***in***);  
 System.***out***.print(**"Please enter the plate number of the vehicle that you want to remove: "**);  
 String deleteplateNumber = deleteVehicleScanner.nextLine();  
  
 **for**(Vehicle vehicle : **listOfVehicles**){  
  
 **if**(vehicle.getVehiclePlateNumber().equals(deleteplateNumber)){  
 String vehicleType = vehicle.vehicleType();  
 **listOfVehicles**.remove(vehicle);  
 System.***out***.println(vehicleType+**" deleted."**);  
 System.***out***.println(**listOfVehicles**.size()+ **" spaces left in the park."**);  
 **break**;  
 }**else**{  
 System.***out***.println(**"Plate number does not exist!!"**);  
 }  
 }  
  
 }  
  
 @Override  
 **public void** printVehicle() {  
 System.***out***.format(**"\_%1$-20s\_%2$-20s\_%3$-20s\n"**,**"\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_"**,**"\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_"**,**"\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_"**);  
  
  
 System.***out***.format(**"|%1$-20s|%2$-20s|%3$-20s|\n"**,**" TYPE"**,**" PLATE NUMBER"**,**" MAKE "**);  
  
 System.***out***.format(**"\_%1$-20s\_%2$-20s\_%3$-20s\n"**,**"\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_"**,**"\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_"**,**"\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_"**);  
 System.***out***.format(**"%1$-20s%2$-20s%3$-20s\n"**,**""**,**""**,**""**);  
  
 **for**(**int** i=0; i<**listOfVehicles**.size(); i++){  
 **if**(**listOfVehicles**.get(i).vehicleType().equals(**"Car"**)){  
 System.***out***.format(**"|%1$-20s|%2$-20s|%3$-20s|\n"**,**" Car "**,**" "**+**listOfVehicles**.get(i).getVehiclePlateNumber(),**" "**+**listOfVehicles**.get(i).getVehicleMake());  
 System.***out***.format(**"\_%1$-20s\_%2$-20s\_%3$-20s\n"**,**"\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_"**,**"\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_"**,**"\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_"**);  
 }**else** {  
 System.***out***.format(**"|%1$-20s|%2$-20s|%3$-20s|\n"**,**" MotorBike "**,**" "**+**listOfVehicles**.get(i).getVehiclePlateNumber(),**" "**+**listOfVehicles**.get(i).getVehicleMake());  
 System.***out***.format(**"\_%1$-20s\_%2$-20s\_%3$-20s\n"**,**"\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_"**,**"\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_"**,**"\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_"**);  
 }  
 }  
  
 }  
  
 @Override  
 **public void** editVehicle(){  
 }  
  
 @Override  
 **public void** searchVehicle(){  
 }  
  
 @Override  
 **public void** filterVehicle(){  
 }  
  
 @Override  
 **public void** checkAvailability(){  
 }  
  
 @Override  
 **public void** bookVehicle(){  
 }  
  
 @Override  
 **public void** save() {  
 }  
}

## RentalVehicleManager class

**public interface** RentalVehicleManager {  
  
 **int *numberOfVehicles*** = 3;  
 **void** addVehicle();  
 **void** deleteVehicle();  
 **void** printVehicle();  
 **void** editVehicle();  
 **void** searchVehicle();  
 **void** filterVehicle();  
 **void** checkAvailability();  
 **void** bookVehicle();  
 **void** save();  
}

## RentalVehicleSystem class

**import** java.util.Scanner;  
  
**public class** RentalVehicleSystem {  
  
 **public static void** main(String[] args) {  
 WestminsterRentalManager rent = **new** WestminsterRentalManager();  
  
 Scanner mainMenuScanner = **new** Scanner(System.***in***);  
  
 **int** menuOption = 0;  
  
 **while** (**true**){  
 System.***out***.println(**" \n"** +  
 **" \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \n"** +  
 **" Welcome to the Westminster Rental Vehicle Manager \n"** +  
 **" ---------------------------------------------- \n"** +  
 **"\n"** +  
 **"1. Add Vehicle \n"** +  
 **"2. Delete Vehicle \n"** +  
 **"3. Print Vehicle List \n"** +  
 **"4. Edit Vehicle List \n"** +  
 **"5. Open the Console \n"**+  
 **"6. Exit the programme \n"** +  
 **"\n"**);  
 System.***out***.print(**"Choose an option: "**);  
 **while** (!mainMenuScanner.hasNextInt()){  
 String wrongdatatype = mainMenuScanner.next();  
 System.***out***.println( wrongdatatype + **" is an invalid data type!!"**);  
 System.***out***.print(**"Choose an option: "**);  
 }  
 menuOption = mainMenuScanner.nextInt();  
 **switch** (menuOption){  
 **case** 1:  
 rent.addVehicle();  
 **break**;  
 **case** 2:  
 rent.deleteVehicle();  
 **break**;  
 **case** 3:  
 rent.printVehicle();  
 **break**;  
 **case** 4:  
 *//edit vehicle list* **break**;  
 **case** 5:  
 *//open the console* **break**;  
 **case** 6:  
 System.***out***.println(**"------->> Program End <<--------"**);  
 System.*exit*(0);  
 **default**:  
 System.***out***.println(**"Please the choose the correct option!!"**);  
 }  
 }  
 }  
}