

## Project 2 Explanation

For project 2, we have developed a one floor parking lot for vehicles such as cars, trucks and motorcycles. There are 7 Java files and we will be explaining what each class does.

### **Main.Java Class**

This is the main class that can perform different tests such as tracking cars that have entered or left the parking lot and a report will be given about it. When cars enter the parking lot, they will be given a ticket containing a ticket id that is generated and their parking spot number. For the simplicity of this project, we'll assume that each ticket's parking spot number isn't randomized and is given in order. In this class we created Vehicle objects and naming them Toyota, Honda, DodgeRam etc, and gave them features such as naming the vehicle model the same name as the vehicle object, license plate, and the Vehicle Type if it's a car or motorcycle or truck. We then assigned a parking ticket for each car and each of them parked in their spots.

Throughout the program we gotten reports of the cars in the parking lot, sorted the parking spots by occupancy and gave a report, sorted the vehicles by license plates, gave a report of cars that left the parking lot at 5pm along with their vehicle information, ticket id, assigned parking spot, and entry time, and disabled the peak hour rate to standard rate. The peak hour rate is \$1 and active if there are 5 cars or more. Since 4 cars left the parking lot, the standard rate was enabled and started charging the cars at a rate of 0.50 cents per hour.

### **ParkingGarage.java Class**

This class is about reading a garage's functionalities and performing some of the back end stuff. The functionalities the Parking Garage does are as follows:

1. This class involves in assigning a parking ticket to know if a spot is taken or not

2. Has a method that checks if the vehicle is parked, assigns ticket, and increments car count.
3. Has a method that if a car leaves the parking lot, it checks the ticket, makes the occupied spot that the car was in available to take in, and decrements the vehicle car count tracker in the parking lot.
4. Has methods to display the current vehicles in the parking lot with their license plate and Vehicle Type, and a method to display parking spots that are available or occupied.
5. Has a method to sort vehicles based on occupancy and license plates. These sorting serve to give a report on the parking lot status and the vehicles in the parking lot.
6. And lastly more methods at the bottom that showcases what they do (from the Parking Garage file)

This class overall contains structures and operations to mainly keep track of vehicles that are parked and an overview of ticket id, entry time, and parking spot a vehicle was in when they leave the parking lot.

### **ParkingLot.java Class**

This class involves adding and removing parking spots. This class:

1. Checks if a specific spot is available
2. Counts how many parking spots are available to use
3. Has a method that can filter and return parking spots that are available and figuring out which spots are occupied. This method is used in the ParkingGarage.java class and calls it to find parking spots that are available.
4. Has a method that sorts vehicles by occupancy. This method is mostly used and called in the ParkingGarage.java class.
5. Uses Generics, Predicates, Comparators and Collections

So overall handles the parking spot procedures and the availability and occupancy of them.

### **ParkingSpot.java Class**

This is a short java class and it involves dealing with the actual parking spot. It has a constructor that grabs the spot number and vehicle type of whichever vehicle is parked. In the constructor we have the variable “isOccupied” set to false to show the parking spot is not taken yet. The class also has other methods such as:

1. getType() - Getter type that returns the vehicle type
2. getSpotNumber() - retrieves the spot number that a vehicle is parked
3. isOccupied() - returns a boolean true or false if the parking spot is taken
4. setOccupied() - takes in a boolean parameter that makes a parking spot occupied

### **ParkingTicket.java Class**

Another short class that deals with parking tickets. It contains a constructor that takes in ticketID, license plate, and parking spot number. This class also reads into the current local data time that will give a report of what time did a vehicle leave the parking lot. It has other methods such as:

1. getParkingSpotNumber() - retrieves parking spot number
2. getTicketId() - gets and returns ticketid
3. getEntryTime() - gets the times that the vehicle left the parking lot.
4. getLicensePlate() - returns the license plate of a vehicle

### **Vehicle.java Class**

This class is about handling the vehicle information and aspects of it. This class contains a constructor that takes in String values of vehicle model of a vehicle (ex: Toyota, Ford), license plate, and Enum Vehicle Type (ex: is the vehicle a Car or Motorcycle or Truck)? The class also contains methods that can:

1. `getLicensePlate()` - retrieves license plate of the vehicle
2. `getType()` - returns the type vehicle type
3. `getVehicleModel()` - returns the vehicle model of the vehicle

### **VehicleType.java Class**

This class only contains an Enumeration of Vehicle Types. The enumeration contains 3 values:

1. Motorcycle
2. Car
3. Truck

These values will be given to a vehicle which will help give an accurate report of what vehicle types are parked in the parking lot. Creating a separate file for the enumeration helps to call the vehicle types without having to write them multiple times in each java field.