1- **UML Use-Case **Diagram and Description

First, creating a file to the customer will help with another services and ensure the bill is created effectively, and efficiently. It is a use case that relates to the figure provided since it will store the information and ease the process.

Use case:	Create a file
Trigger:	The customer wants to have a file to store his information before doing the services on the garage.
Precondition:	The customer is authenticated.
Main scenarios:	
1-	The customer reach out the clerk.
2-	The clerk provide the customer with a list to fill in.
3-	The customer specifies his information.
4-	The clerk enter the information into the system.
5-	The system stores the information provided.
6-	The system display the information.
7-	The clerk singles to the system that everything is correct to start creating a file
8-	The system creates a file with the information provided.
Exceptions:	
7a	1- The information is wrong or missing 2- The system noties the cleck to adjust it with the customer.

Second, checking the vehicle is an important use case to include since it shows the process the customer will go through. It relates to the figure as it shows the servies the customer had at the garage and having them will guide us with creating the bill later on.

Use case:	Check the vehicle
Trigger:	The customers needs his vehicle to be checked on the garage.
Precondition:	The customer is authenticated
Main scenarios:	
1-	The customer enter his personal details into the system.
2-	The customer enter the services he/she wants.
3-	The system stores the information provided.

4-	The system checks if the services are available.
5-	The system checks who is the responsible mechanic for those servies.
6-	The system notfies the mechanic that he/she has a customer.
7-	The mechanic do the services.
Exceptions:	
4a	1-The services are not available. 2-The customer chooses a different service.
5a	1- The mechanic is not available. 2- The system looks for a substitute.

Thirdly, the receipt or invoice will be created which is the most important use case that will help the car garage manage their billing system effecteivly. It ensures the information, and calculations provided, and created appropriately.

Use Case:	Create a receipt
Trigger:	The car garage wants to create a receipt to manage bills.
Precondition:	The customer is authenticated
Main scenarios:	
1-	The customer enters his personal details.
2-	The clerk receives the customer's information.
3-	The clerk check who was the mechanic.
4-	The clerk enter the mechanic name and date of the services.
5-	The clerk ensures all the information are entered and appropriate.
6-	The system stores the information.
7-	The clerk enter the customer chosen services into the system.
8-	The system displays the amount of each service.
9-	The system calculate the total amount and taxes.
10-	The system calculate discounts.
11-	The system displays the final amount of services.
12-	The system creates the bill with all the information.

13-	The clerk prints the bill and upload it to the system.
Exceptions:	
10a	The customer might not have a discount.

2- **UML Class **Diagram and Description

List of Classes and attributes:

Customer: firstName, lastName, cellPhoneNumber, gender, dateOfBirth.

Service: serviceName, servicePrice, mechanicName, date, numberOfServices.

Vehicle: type, color, id, yearOfVehicle, make.

Car: doors, type, color, id, yearOfVehicle, make.

Price : taxes, total, discount, finalAmount, servicePrice.

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The class customer has 5 attributes with their type and their setter and getter function are included.

Customer
-firstName: String -lastName: String -cellPhoneNumber: String -gender: ENUM -dateOfBirth: Date
+setFirstName(firstName:String) +getFirstName():String +setLastName(lastName:String) +getLastName():String +setCellPhoneNumber(cellPhoneNumber:String) +getCellPhoneNumber():String +setGender(gender:Gender) +getGender():ENUM

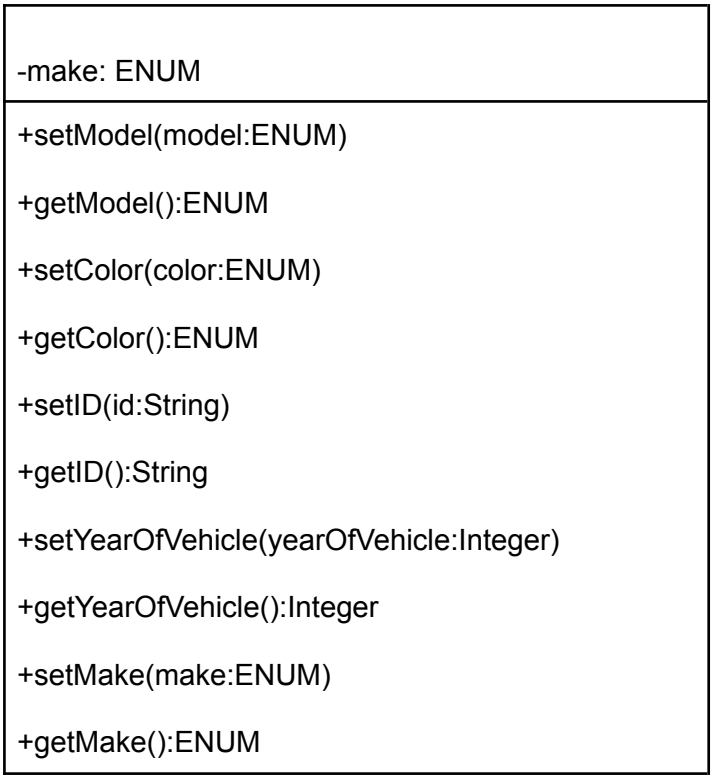
+setDateOfBirth(dateOfBirth:Date) +getDateOfBirth():Date

The class Service has 5 attributes with their type and their setter and getter function are included.

Service
-serviceName: String -servicePrice: Float -mechanicName: String -dateOfService: Date -numberOfService: Integer
+setServiceName(serviceName:String) +getServiceName():String +setServicePrice(servicePrice:Float) +getServicePrice():Float +setMechanicName(mechanicName:String) +getMechanicName():String +setDateOfService(dateOfService:Date) +getDateOfService():Data +setNumberOfService(numberOfService:Integer) +getNumberOfService():Integer

The class Vehicle has 5 attributes with their type and their setter and getter function are included. It is the parent class of the class car. There is a “is a” relationship between them where A car is a Vehicle and it is a Single inheritance..

Vehicle
-model: ENUM -color: ENUM -id: String -yearOfVehicle: Integer



The class Car has 6 attributes with their type and their setter and getter function are included. It is the child class of the class Vehicle and it inherates its attributes. One attribute “numberOfDoors” is related to Cars specifically since since the vehicle can be motorcycles, boats, or airplanes, where the concept of doors may not apply. There is a “is a” relationship between them where A car is a Vehicle and it is a Single inheritance.

Car
-model: ENUM -color: ENUM -id: String -yearOfVehicle: Integer -make: ENUM -numberOfDoors: Integer
+setModel(model:Model) +getModel():ENUM +setColor(color:Color) +getColor():ENUM +setID(id:String) +getID():String +setYearOfVehicle(yearOfVehicle:Integer) +getYearOfVehicle():Integer +setMake(make:Make) +getMake():ENUM +setNumberOfDoors(numberOfDoors:Integer) +getNumberOfDoors():Integer

The class Price has 5 attributes with their type and their setter and getter function are included.

Price
-taxes: Float -total: Float -discount: Float -finalAmount: Float -servicePrice: Float

+setTaxes(taxes:Float) +getTaxes():Float +setTotal(total:Float) +getTotal():Float +setDiscount(discount:Float) +getDiscount():Float +setFinalAmount(finalAmount:Float) +getFinalAmount():Float +setServicePrice(servicePrice:Float) +getServicePrice():Float

The other relationships might be an associations, but not inheritance, the only one is the vehicle and the car.

Object 1

James: Customer
-firstName=”James" -lastName="W.Jones" -cellPhoneNumber="816-897-9862" -gender=Gender.Male -dateOfBirth=[1990-10-05]

Object 1

Service1: Service
-serviceName="Diagnostics" -servicePrice=”15” -mechanicName=”Hans K" -dateOfService="March 13, 2022" -numberOfService=”1”

Object 2

Service2: Service
-serviceName="Oil Replacement"
-servicePrice=”120”
-mechanicName=”Hans K"
-dateOfService="March 13, 2022"
-numberOfService=”2”

Object 3

Service3: Service
-serviceName="Oil Filter Parts"
-servicePrice=”35”
-mechanicName=”Hans K"
-dateOfService="March 13, 2022"
-numberOfService=”3”

Object 4

Service4: Service
-serviceName="Tire Replacement (2)"
-servicePrice=”100”
-mechanicName=”Hans K"
-dateOfService="March 13, 2022"
-numberOfService=”4”

Object 5

Service5: Service
-serviceName="Tire (2)"
-servicePrice=”160”
-mechanicName=”Hans K"

-dateOfService="March 13, 2022" -numberOfService=”5”

Object 1

Price1: Price
-taxes=”21.5” -total=”451.5” -discount=”11.5” -finalAmount=”440” -servicePrice=15”

Object 2

Price2: Price
-taxes=”21.5” -total=”451.5” -discount=”11.5” -finalAmount=”440” -servicePrice=”120”

Object 3

Price3: Price
-taxes=”21.5” -total=”451.5” -discount=”11.5” -finalAmount=”440” -servicePrice=”35”

Object 4

Price4: Price
-taxes=”21.5”
-total=”451.5”
-discount=”11.5”
-finalAmount=”440”
-servicePrice=”100”

Object 5

Price5: Price
-taxes=”21.5”
-total=”451.5”
-discount=”11.5”
-finalAmount=”440”
-servicePrice=”160”

Object 1

Car1: Car
-model=Model.Altima
-color=Color.Silver
-id=”AD-89034
-yearOfVehicle=”2014”
-make=Make.Nissan -numberOfDoors=”4”

Object 1

Vehicle1: Vehicle
-model=Model.Altima
-color=Color.Silver

-id=”AD-89034

-yearOfVehicle=”2014”

-make=Make.Nissan