**Case Study: Vehicle Registration System.**

A major vehicle dealer wants to develop a system to track the inventory of vehicles their chain of showrooms sells on a national level. After discussion among major stakeholders, following major business requirements have been outlined.

* 3 major classes of Vehicles **Car** and **Bike and EVCar** need to be tracked.
* Amongst other essential features of vehicles such as number of seats, tax and insurance amount, etc.
* System should allow creation of new records(objects) for particular categories and must allow storage of records in a common collection (array) called "Inventory". (Hint: Consider creating an array of the Parent Class and store pointers to objects created in this array).
* System should include functionalities (functions)
  + To get details about a vehicle by passing the registration Number of the vehicle.
  + To count the number of vehicles of a particular category that are stored in the inventory based on Category passed.
  + To fetch the average price of vehicles of a particular category stored in the inventory.
  + To calculate tax applicable for vehicle registration based on type & price of the vehicle. (Refer to the Tax section below)

**Data Values**

There should be a provision to store registration Number, Vehicle Brand, vehicle Model, battery capacity, fuel tank capacity,Ex-Showroom price, no of seats and Type.Refer to the tables with data values below for more details. Identify how this data can be modeled in your java program including inheritance hierarchy, data type for values, etc.

| **CAR** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Reg Number** | **Brand** | **Model** | **battery capacity**  **(in Kws)** | **fuel tank**  **Capacity (in Litres)** | **Price(in lacs)** | **No.of Seats** | **TYPE** |
| MH-12-1299 | “Maruti” | “DZIRE | NA | 37 | 8.27 | 5 | SEDAN |
| MH-12-2000 | TATA | ALTROZ | 34.3 | NA | 11 | 5 | HATCHBACK |
| MH-12-2000 | HONDA | “City” | NA | 38 | 15 | 5 | SEDAN |
| MH-12-2000 | “Kia” | “Carens” | 45.2 | NA | 15 | 5 | SUV |
| MH-12-2000 | CHEVROLET | CRUZE | NA | 45 | 18.21 | 5 | SEDAN |

| **Bike** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Reg Number** | **Brand** | **Model** | **battery capacity**  **(in Kws)** | **fuel tank**  **Capacity (in Litres)** | **Price(in lacs)** |
| MH-12-11 | HONDA | “Shine” | NA | 15 | 1.21 |
| MH-12-13 | BAJAJ | “Pulsar” | NA | 13 | 1.65 |
| MH-12-14 | OLA | “S1 Pro” | 4.5 | NA | 1.45 |
| MH-12-14 | TVS | APACHE | NA | 15 | 1.81 |
| MH-12-15 | BAJAJ | “Gladiator” | NA | 14 | 1.21 |

**Tax**

* **For vehicles with Electric Battery**

| **Price** | **Tax** |
| --- | --- |
| less than 12 | 10.00% |
| More than 12 | 20.00% |

* Tax Applicable for vehicles with IC Engine

| **Price Range** | **TYPE** | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **SEDAN** | | **SUV** | | **HATCHBACK** | |
| **<= 4 seater** | **> 4 seater** | **< 4 seater** | **> 4 seater** | **< 4 seater** | **> 4 seater** |
| less than 12 | 5.00% | 7.00% | 10.00% | 15.00% | 3.00% | 5.00% |
| More than 12 | 10.00% | 14.00% | 20.00% | 30.00% | 6.00% | 10.00% |

* Tax on bike type vehicles

| **Price** | **Electric** | **IC Bike** |
| --- | --- | --- |
|
| less than 1.5 | TaxNAException | 10.00% |
| More than 1.5 | 10.00% | 20.00% |