SDP ASSIGNMENT TASK 1

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**Problem Description:**

*A vehicle registration happens in Bangladesh, and involves a particular vehicle and its owners.*

*You may assume that there is only one owner per vehicle. Each vehicle maps to a vehicle*

*description that includes its manufacturing date, model, year, and manufacturer. A registration*

*can be renewed multiple times for the same owner and vehicle at the same county OR a different*

*one. It is necessary to keep track of the City in which the renewal was made. The vehicle*

*registration system is to be designed for quick retrieval of information about any vehicle or any*

*vehicle owner (in any City) and the related registration details.*

**Project stack**:

* Python

**Classes used:**

* RegistryInterface: Interface
* Vehicle: Class
* VehicleRegistrationSystem: Class
* RegistrationAdapter: Class

**Assumptions:**

1. RegistryInterface
   1. Contains abstract methods-
      1. register(): Registers the vehicle
      2. renew(): Renews the registration
      3. registry\_information(): Returns registry information
   2. Vehicle class and VehicleRegistrationSystem class are going to implement the abstract methods of this class.
2. Vehicle
3. This class can be constructed using three necessary parameters-
   1. owner: String
   2. manufacturer: String
   3. manufacturing\_year: String
   4. manufacturing\_date: String
   5. model: String
   6. datastore: <pandas.dataframe> (Private variable)
4. At the time of constructing a vehicle an additional string field ‘id’ is attached to the vehicle parameters.
5. Vehicle instance can print its information by simply print(vehicle\_instance) call.
6. Both registration and renewal methods store the information of the city and country where registration/renewal has happened.
7. Registration process -
   1. External client calls the register() method.
   2. City and country are passed through parameters.
   3. If the vehicle is not registered already then the data is saved in the datastore.
   4. If the vehicle is already registered, an exception is raised
8. Renewal process -
   1. External client calls the renew() method.
   2. City and country are passed through parameters.
   3. If the vehicle is registered already then the data is saved in the datastore.
   4. If the vehicle is not already registered, an exception is raised
9. Method registry\_information() gives the registry data.

3. VehicleRegistrationSystem

1. This class is constructed with a private datastore.
2. There can be one instance reference of this class. (Maintaining singleton design pattern.)
3. Registration and renewal both require city and country as well as all the vehicle information.
4. Registration information is saved if the vehicle is not registered already. Else one exception is raised.
5. Renewal information is saved if the vehicle is registered already. Else one exception is raised.
6. Method registry\_information() gives the registry data.
7. Method search() returns the field information that matches with the certain attribute value that is specified in the argument.

4. RegistrationAdapter

1. This class works as an adapter for vehicles and the registration system.
2. It is constructed with a vehicle\_registration\_system instance.
3. Method registration() takes the vehicle instance, city and country for parameter and performs the action.
4. Method renew() takes the vehicle instance, city and country for parameter and performs the action.

**Overall:**

Composite, singleton and adapter design pattern has been used for this problem.