**Software Development 3**

In this exercise you are required to write a set of classes to manage the calculation of import duty on cars imported into Ireland from Japan and the Eurozone. The duty on cars is calculated as the duty rate \* price.

The requirements for each of the classes you need to create are documented below.

**Car class**

The Car class has 3 member variables to represent the price, duty rate and the model of the car. Choose suitable data types.

Create a suitable constructor to intialise member variables using a parameter list.

Create suitable getter() and setter() methods.

Create an abstract calcDuty() method that returns the amount of duty that has to be paid as a double.

Create a suitable toString() method that displays the car details.

**JapaneseImport**

A Japanese import is a type of car.

This class has one additional member variable representing the name of the departure port from where the car leaves in Japan.

Create a suitable constructor to initialise appropriate member variables.

Create suitable getter() and setter() methods.

Create a calcDuty() method that calculates and returns the amount of duty that has to be paid as a double. Note that cars which depart from the port of Osaka incur an additional duty of 5%.

Create a suitable toString() method that displays the car details.

**EurozoneImport**

A Eurozone import is a type of car.

This class has one additional member variable representing the discount applicable on the **price** of a car imported from another euro zone country.

Create a suitable constructor to intialise appropriate member variables.

Create suitable getter() and setter() methods.

Create a calcDuty() method that calculates and returns the amount of duty that has to be paid as a double. Duty is calculated on the discounted price of the car.

Create a suitable toString() method that displays the car details.

**Test Class**

In your test class you are required to create a collection of Car objects using the sample data shown below:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Car Type** | **Model** | **Price** | **Duty rate** | **Discount** | **Port** |
| EurozoneImport | BMW | 35000 | 5% | 2% |  |
| JapaneseImport | Honda | 40000 | 7% |  | Tokyo |
| JapaneseImport | Toyota | 45000 | 6% |  | Osaka |
| JapaneseImport | Nissan | 43000 | 8% |  | Osaka |

You then need to write code to do the following:

* Display details of each car
* Calculate and display the duty paid on each one.
* Calculate and display the amount of duty paid on cars that are imported from the port of Osaka.
* Display the total amount of duty paid on all cars.

See sample output below as a guide:

Model: BMW Price: €35000.0 Duty: 0.05 EU discount: 0.02

Amount of Duty paid: €1715

Model: Honda Price: €40000.0 Duty: 0.07 Departure port: Tokyo

Amount of Duty paid: €2800

Model: Toyota Price: €45000.0 Duty: 0.06 Departure port: Osaka

Amount of Duty paid: €4950

Model: Nissan Price: €43000.0 Duty: 0.08 Departure port: Osaka

Amount of Duty paid: €5590

Total amount of Duty paid for Osaka is: €10540.0

Total amount of Duty paid on all cars is: €15055.0