# Java task 1: Creation of vehicle tax system

This task is to create a system to allow users to calculate the amount due for a tax disc for a specific vehicle.

Requirements are as follows:

1. The user must be able to select a vehicle type from a list, including Private Car, Lorry, and Taxi.
2. For each type of car, the user must be able to enter other key details as per Appendix 1
3. After entering all details for the given vehicle type, the system must display a message to the user saying “The tax for vehicle <registration plate> will be <amount>” where the text in angle brackets is replaced with actual values.
4. The system must be flexible enough to allow later additions of new types of car without reprogramming existing functionality.
5. There is currently no requirement to persist data from one run of the program to the next.

Constraints are as follows:

1. Later on, subsequent tasks may be set which extend this capability, but for the time being work should be focused on meeting the above requirements only.
2. Before coding starts, a brief design overview should be written by Xin and approved by Pete. This must include a description of the sequence of development tasks and testing approach.
3. Core Java should be used, no external 3rd party libraries.
4. Code should be unit tested.
5. Code should be delivered in a Git repository.

# Appendix 1: Vehicle type details

|  |  |  |
| --- | --- | --- |
| **Vehicle type** | **Attribute name** | **Restrictions & input rules** |
| Private car | Registration plate |  |
|  | Engine capacity |  |
|  | CO2 emissions | Any positive, whole number. |
| Lorry | Registration plate |  |
|  | Engine capacity |  |
|  | Number of fixed wheels | Any even, whole number between 4 and 12 inclusive.  If over 12, then message displayed saying “Vehicles with more than 12 wheels are not permitted on Irish roads. Please try again.” followed by a further prompt for the number of wheels.  If less than 4, then message displayed saying “Lorries must have at least 4 wheels. Please try again.” |
|  | Unloaded weight | Specified in tonnes as a fractional number to max 2 decimal places |
| Taxi | Registration plate |  |
|  | Engine capacity |  |
|  | Maximum number of passengers | Any number 1 – 10 |

Unless specified above, formats of repeated fields must follow these rules

1. “Registration plate” must be in Irish number plate format as per [Wikipedia](https://en.wikipedia.org/wiki/Vehicle_registration_plates_of_the_Republic_of_Ireland#Format_and_specifications)
2. Engine capacity must be 1000 CC or over. User can specify number in litres or in CC.

# Appendix 2: Tax calculation rates

Private vehicle tax must be calculated by retrieving the appropriate annual amount from the tables at these two links based on registration year:

* <http://www.simi.ie/Taxation/Motor+Tax/Motor+Tax+Rates+on+Co2+Emissions.html>
* <http://www.simi.ie/Taxation/Motor+Tax/Motor+Tax+Rates+on+Engine+Size.html>

Then apply an additional 20% to those values if the engine capacity is greater than 2000CC.

Lorry vehicle tax calculated as the sum of:

* 10% of engine capacity in CC
* 100 times the number of wheels
* 4 times the unloaded weight

Taxi vehicle tax calculated as 10% of engine capacity in CC plus 10 times the maximum number of passengers.