JAVA HOMEWORK

The vehicle convoy

🏁To start with, import <u>the given project</u> into your Eclipse editor

<mark>CHALLENGE 1</mark>

We want to manage 3 kind of vehicles:

The TucTuc   The MiniVan   The BatMobile

<u>Attributes</u>

- <u>All vehicles</u> have the following properties:
  - **plateID** (String): the plate ID of the vehicle
  - **weight** (float): the weight of the vehicle

- <u>Some vehicles</u> have some specific properties:
  - BatMobile :
    - isBatmanHere (boolean): true if Batman is inside the car
  - MiniVan:
    - nbCustomers (int): the number of passengers in the van
  - TucTuc:
    - nbCustomers (int) : the number of passengers in the tuctuc

<u>Methods</u>

- You must implement the method **toString**() on each class that returns the following string (in red the value of the attributes):

BatMobile	BatMobile [plate id=thePlateId, weight=theWeight]
MiniVan	MiniVan [plate id=thePlateId, weight=theWeight]
TucTuc	TucTuc [plate id=thePlateId, weight=theWeight]

- You must create the method **getMaximalSpeed** () on each class that returns the following integer

	How the maximal speed is computed
BatMobile	If batman is in the car, the speed is 500, otherwise the speed is 110
MiniVan	The maximal speed is 130, but for each passenger in the van, the speed is decreased by 10
TucTuc	The maximal speed is 130, but for each passenger in the van, the speed is decreased by 5

Q1: Create the classes BatMobile, MiniVan and TucTuc

The Main shall **produce the given result:**

```
MiniVan [plate id=XXXXXX, weight=45.0] speed is 30
TucTuc [plate id=YYYYYYY, weight=45.0] speed is 115
BatMobile [plate id=ZZZZZZZ, weight=45.0] speed is 110
```

CHALLENGE 2

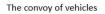Now it's time to factorize and clean your code.

Q2: Create an abstract class **Vehicle**.

- Class TucTuc, MiniVan and BatMobile inherit from this class
- Move the common code (attributes and methods) to this new abstract class to avoid the duplication of code

The Main shall still **produce the given result:**

```
MiniVan [plate id=XXXXXX, weight=45.0] speed is 30
TucTuc [plate id=YYYYYYY, weight=45.0] speed is 115
BatMobile [plate id=ZZZZZZZ, weight=45.0] speed is 110
```

CHALLENGE 3

The convoy of vehicles

Now we have to define a convoy of vehicles:

- A convoy of vehicles is a list of vehicles moving forward along the road
- The speed of this convoy is the speed of the slowest vehicle of the convoy.

We define the class VehicleConvoy with the specific attributes/methods:

Attribute

- Vehicles: List<Vehicle> the list of vehicle of this convoys

Methods

- `addVehicle(Vehicle vehicle)`
  Add a vehicle to the convoy
- `getMaximalSpeed()`
  Get the speed of the convoy, which shall be the speed of the slowest vehicle of this convoy

Q3

- Implement the class VehicleConvoy as specified above
- Add the following line to your main class :

```
VehicleConvoy convoy = new VehicleConvoy();
convoy.addVehicle(batman);
convoy.addVehicle(tuctuc);
convoy.addVehicle(miniVan1);
System.out.println("Convoy speed is " + convoy.getMaximalSpeed());
```

- The Main shall **produce the given result:**

```
MiniVan [plate id=XXXXXX, weight=45.0] speed is 30
TucTuc [plate id=YYYYYYY, weight=45.0] speed is 115
BatMobile [plate id=ZZZZZZZ, weight=45.0] speed is 110

Convoy speed is 30
```