**Lab 2 - Inheritance**

**Implement the following classes:**

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| **Vehicle** |
| - manufacturer : String  - name : String  - engine : Engine   - body : Body  - profit : double |
| + Vehicle(manufacturer : String, name : String, engine : Engine, body : Body, profit : double)  + setManufacturer(manufacturer : String) : void  + getManufacturer() : String   + setName(name : String) : void   + getName() : String   + setEngine(engine : Engine) : void  + getEngine() : Engine  + setBody(body : Body) : void  + getBody() : body  + setProfit(profit : double) : void   + getProfit() : double   # abstract calculateTatalPrice() : double  + toString() : String |

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| **Car** |
| - doors : int  - gear : String   - gearPrice : double |
| + Car(manufacturer : String, name : String, engine : Engine, body : Body, profit : double, doors : int, gear : String, gearPrice : double)  + setDoors(doors : int) : void  + getDoors() : int   + setGear(gear : String) : void   + getGear() : String  + setGearPrice(gearPrice : double) : void   + getGearPrice() : double  + calculateTotalPrice() : double  + toString() : String |

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| **Train** |
| - compartments : int  - fuel : String  - cornpartmentPrice : double |
| + Train(manufacturer : Stricw, name : String, engine : Engine, body : Body, profit : double, compartments : int, fuel : String, compartmentPrice : double)  + setCompartments (compartments : int) : void  + getCompartments () : int  + setFuel(fuel : String) : void   + getFuel() : String   + setCompartmentPrice(compartmentPrice : double) : void  + getCompartmentPrice () : double + calculateTotalPrice() : double  + toString() : String |

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| **Engine** |
| - id : String  - cost : double |
| + Engine(id : String, cost : double)  + setld(id : String) : void  + getld() : String  + setCost(cost : double) : void   + getCost() : double   + toString() : String |

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| **Body** |
| - width :  - height : double  - seats : int   - cost : double |
| + Body(width : double, height : double, seats: int, cost : double)  + setWidth(width : double) : void  + getWidth() : double   + setHeight(height : double) : void  + getHeight() : double   + setSeats(seats : int) : void  + getSeats() : int  + setCost(cost : double) : void  + getCost() : double  + toString() : String |

In this lab, you will be using inheritance to create a car and a train.

The Vehicle class is made up of an Engine and a Body and some other variables. It has setter and getter methods and a method called calculateTotalPrice which should be implemented by subclasses of Vehicle.

The Car class and the Train class are both subclasses of Vehicle. This means that you have to use inheritance to create both classes. Each of these classes' constructors must call the superclass constructor. Moreover, both of these classes have to implement the calculateTotalPrice method which has to sum up the total price of the vehicle plus the compartments' price if it is a train or the gear price if it is a car.

Write a tester class which has an array of Vehicles.

The array should contain two cars and two trains.

 Printing format is as follows:

(manufacturer) (name)

Engine:

(id) $(cost)

Body:

 (width)x(height)M

 (seats) seats

 (compartments) compartments (if train)

(doors) doors (if car)

Price:

 $(calculateTotalPrice())

Solution: <http://www.javaproblems.com/2013/12/creating-inheritance-and-polymorphism.html>