

Composition

In this lesson, you'll learn how to achieve composition in Java.

WE'LL COVER THE FOLLOWING ^

- Example
- Implementation

Composition is the practice of creating other class objects in your class. In such a scenario, the class which creates the object of the other class is known as the *owner* and is responsible for the lifetime of that object.

Composition relationships are **Part-of** relationships where the *part* must constitute part of the whole object. We can achieve composition by adding smaller parts of other classes to make a complex unit.

So, what makes the composition so unique?

In **composition**, the lifetime of the owned object depends on the lifetime of the owner.

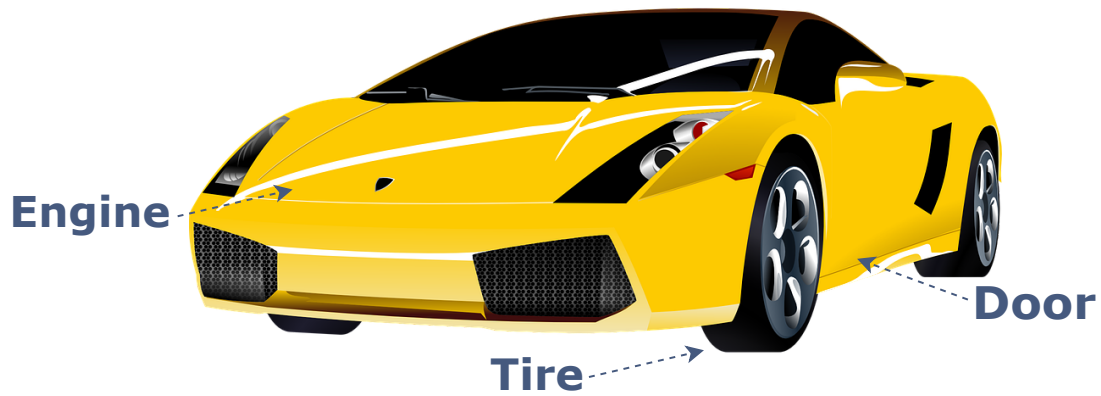
Example

A **car** is composed of an *engine*, *tires*, and *doors*. In this case, a **Car** owns these objects so a **Car** is an *Owner* class and **tires**, **doors** and **engine** classes are *Owned* classes.

Implementation

Let's look at the implementation of **Car** class for better understanding:

A car is composed of engine, tires and doors.



```
class Engine {  
  
    private int capacity;  
  
    public Engine(){  
        capacity = 0;  
    }  
  
    public Engine(int cap) {  
        capacity = cap;  
    }  
  
    public void engineDetails() {  
        System.out.println("Engine details: " + capacity);  
    }  
}  
  
class Tires {  
  
    private int noOfTires;  
  
    public Tires() {  
        noOfTires = 0;  
    }  
  
    public Tires(int nt) {  
        noOfTires = nt;  
    }  
  
    public void tireDetails() {  
        System.out.println("Number of tyres: " + noOfTires);  
    }  
}
```



```

}

class Doors {

    private int noOfDoors;

    public Doors() {
        noOfDoors = 0;
    }

    public Doors(int nod) {
        noOfDoors = nod;
    }

    public void doorDetails() {
        System.out.println("Number of Doors: " + noOfDoors);
    }

}

class Car {

    private Engine eObj;
    private Tires tObj;
    private Doors dObj;
    private String color;

    public Car(String col, int cap, int nt, int nod) {
        this.eObj = new Engine(cap);;
        this.tObj = new Tires(nt);;
        this.dObj = new Doors(nod);

        color = col;
    }

    public void carDetail() {
        eObj.engineDetails();
        tObj.tireDetails();
        dObj.doorDetails();
        System.out.println("Car color: " + color);
    }

}

class Main {

    public static void main(String[] args) {
        Car cObj = new Car("Black", 1600, 4, 4);
        cObj.carDetail();
    }

}

```



We have created a **Car** class which contains the objects of **Engine**, **Tires** and **Doors** classes. The **Car** class is responsible for the lifetime of the owned

objects, i.e., when the Car dies, so does the *tires*, *engine* and *doors*.

Now, let's test your knowledge with a quick quiz!