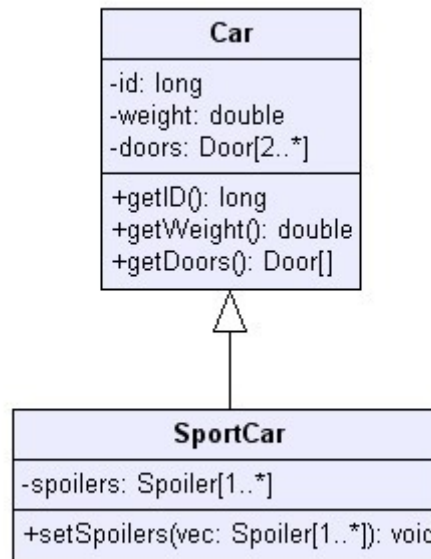# Inheritance

Inheritance

- Inheritance is a way to declare new classes based on another class that was already defined.

- The new class, known as the derived class, inherits attributes and operations from the already existing class, also known as the base class.

- Objects instantiated from the derived class will include both the attributed that belong to the derived class and the ones that belong to the base class.

Inheritance

- Operations that were declared in the base class can be executed both on objects that were instantiated from the base class and objects that were instantiated from the derived one.

- Using inheritance it is possible to reuse code with nearly zero modifications and it is possible to implement polymorphism and a flexible design.
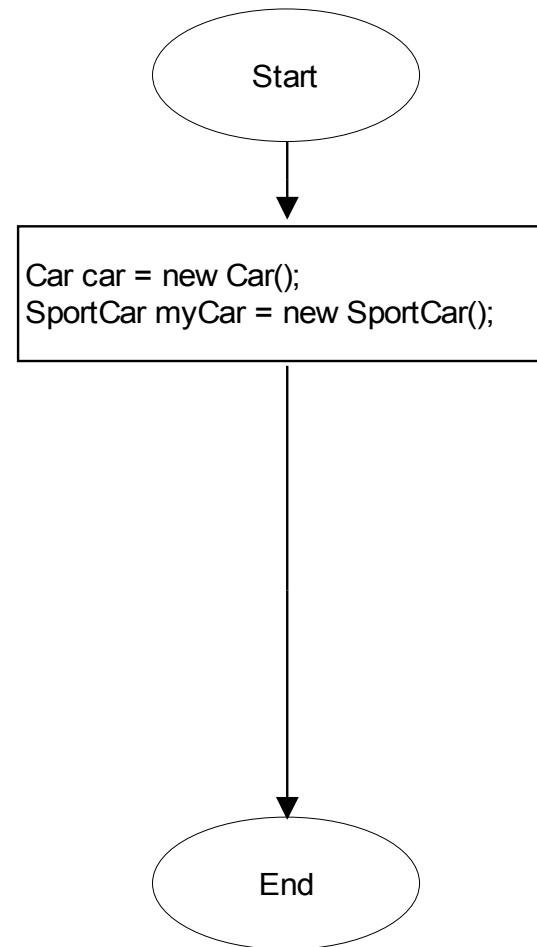
Cars Inheritance Sample
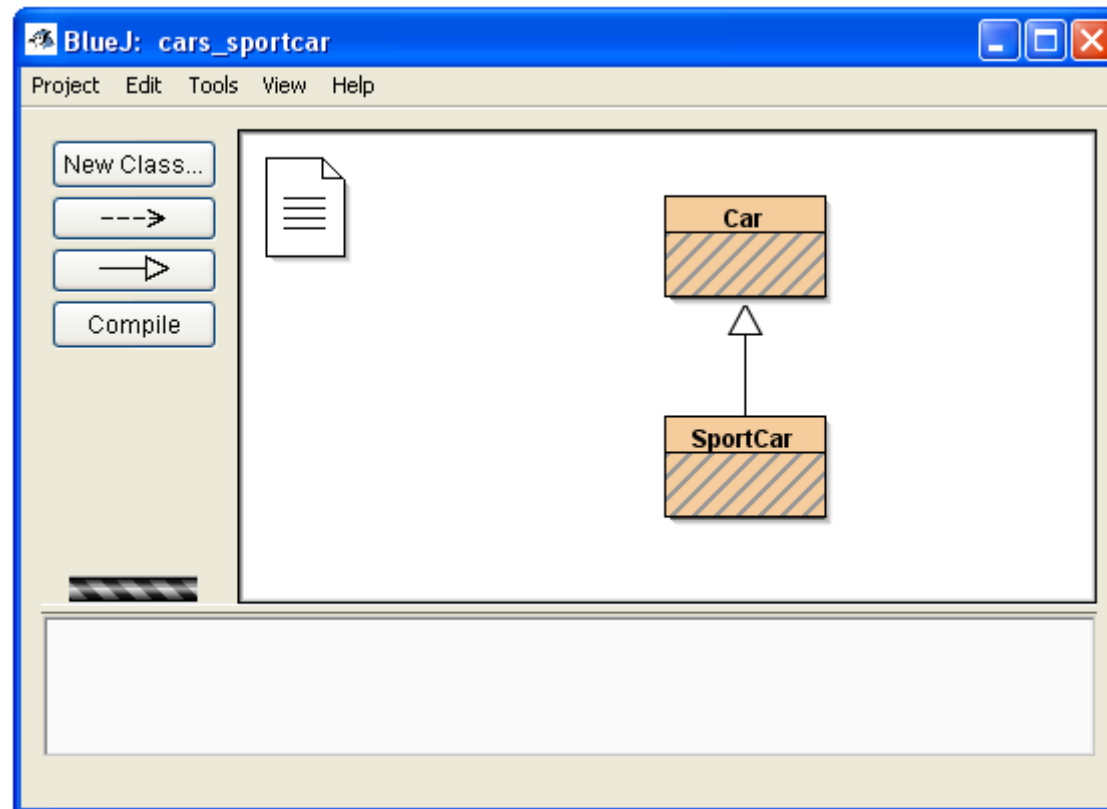
Cars Inheritance Sample

```
class Car
{
  private long id;
  private weight double;
  private Door[] doors;
  public long getId()
  {
    return id;
  }
  public double getWeight()
  {
    return weight;
  }
}

class SportCar extends Car
{
    Spoiler[] spoilers;
    public void setSpoilers(Spoiler[] vec)
    {
        spoilers = vec;
    }
}
```
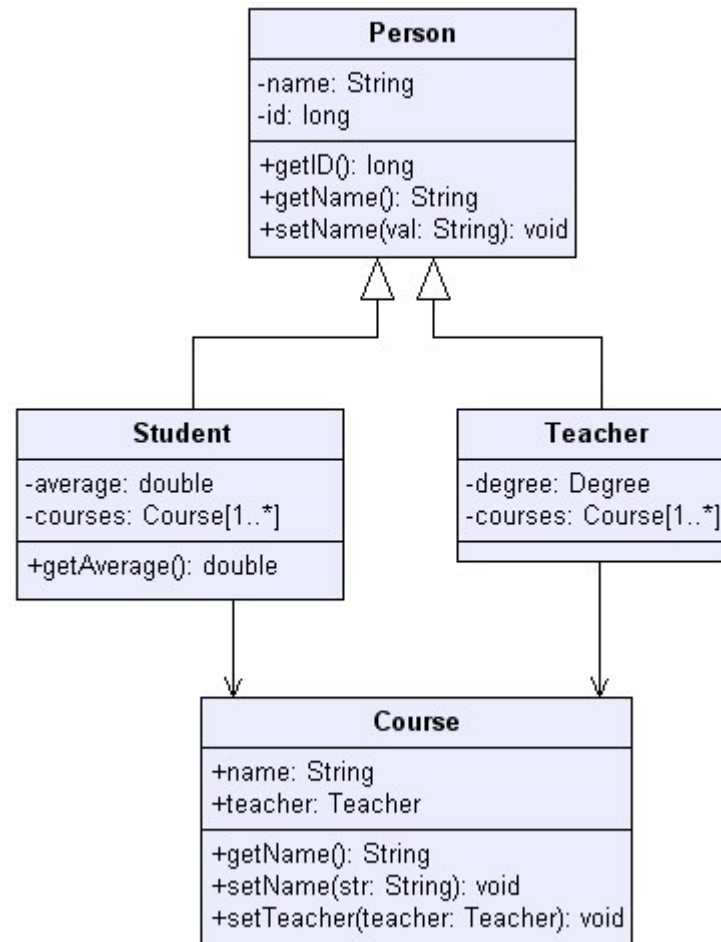
Start

```
Car car = new Car();
SportCar myCar = new SportCar();
```

End

Cars Inheritance Sample
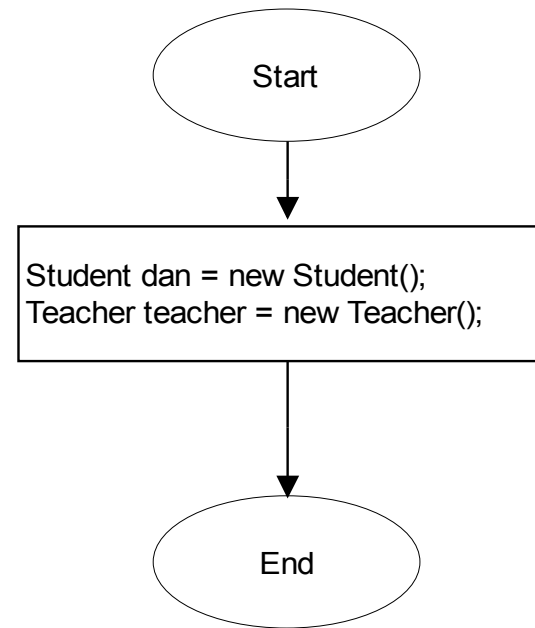
Person Student Teacher Sample

Person Student Teacher Sample

```
class Person
{
  private long id;
  private String name;
  public long getId()
  {
     return id;
  }
}

class Student extends Person
{
    private double average;|
    private Course courses[];
    public double getAverage()
    {
        return average;
    }
}

public class Teacher extends Person
{
    private Degree degree;
    private Course courses[];
}
```

Start

Student dan = new Student();
Teacher teacher = new Teacher();

End

Person Student Teacher Sample