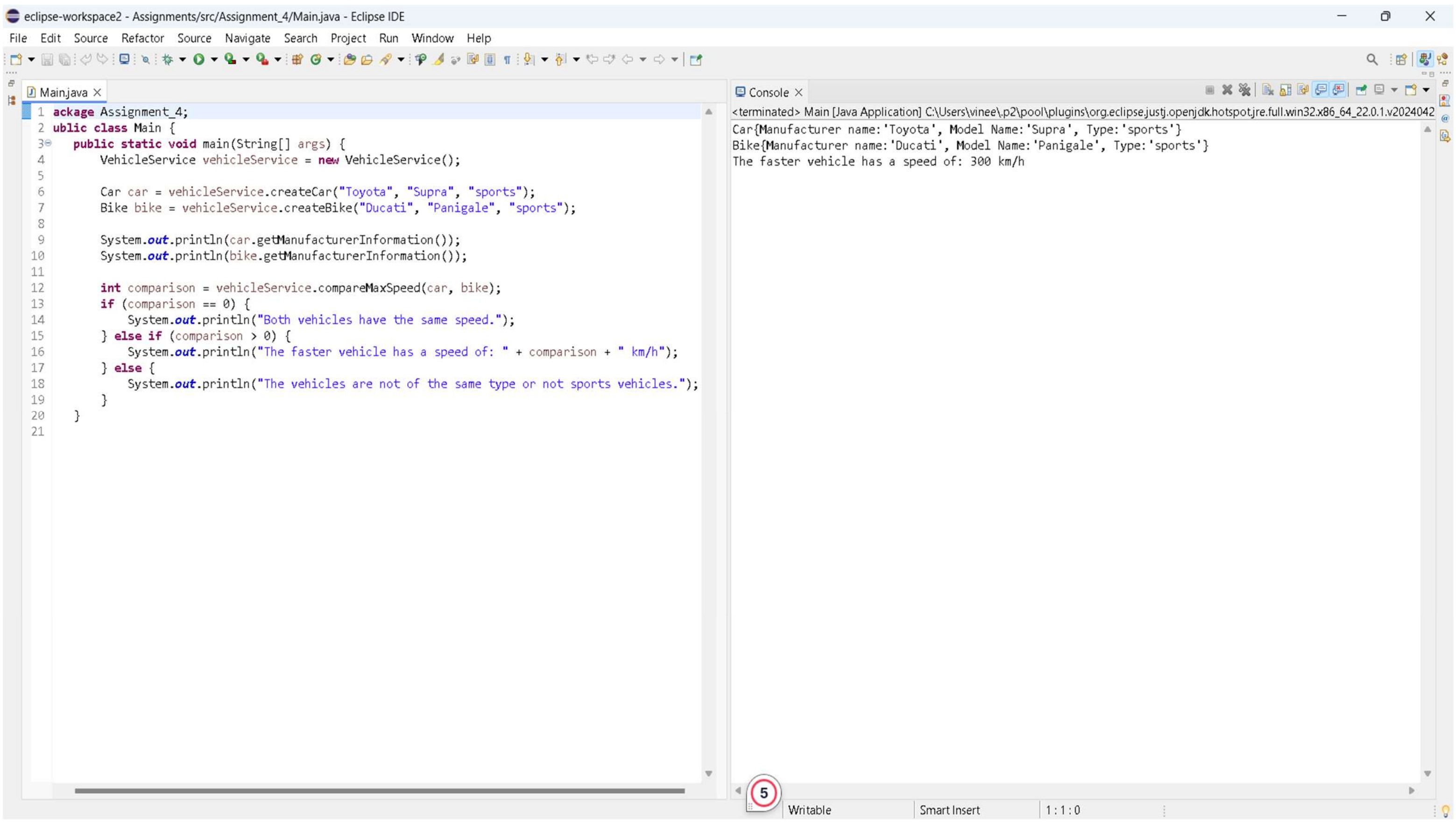
```
package Assignment_4;
public abstract class AbstractManufacturer {
        private String name;
        private String modelName;
        private String type;

        public AbstractManufacturer(String name, String modelName, String type) {
           this.name = name;
           this.modelName = modelName;
           this.type = type;
        }
        public String getName()
        {
           return name;
        }
        public String getModelName()
        {
           return modelName;
        }
        public String getType()
        {
           return type;
        }
        public abstract String getManufacturerInformation();
        }
```

```
package Assignment_4;
//Bike Class
public class Bike extends AbstractManufacturer implements Vehicle {
public Bike(String name, String modelName, String bikeType) {
  super(name, modelName, bikeType);
}

@Override
public int maxSpeed(String bikeType){
  if(bikeType.equalsIgnoreCase("sports")){
     return 300;
  }else if (bikeType.equalsIgnoreCase("cruiser")){
     return 170;
  }
  return 0; // Default case if the type doesn't match
}

@Override
public String getManufacturerInformation(){
  return "Bike{Manufacturer name:'" + getName() + "', Model Name:'" + getModelName() + "',
Type:'" + getType() + "'}";
     }


}
```

```
package Assignment_4;
//Car Class
public class Car extends AbstractManufacturer implements Vehicle {
public Car(String name, String modelName, String carType){
  super(name, modelName, carType);
}
@Override
public int maxSpeed(String carType){
  if (carType.equalsIgnoreCase("sports")){
      return 250;
  } else if (carType.equalsIgnoreCase("sedan")){
      return 190;
  }
  return 0; // Default case if the type doesn't match
}
@Override
public String getManufacturerInformation(){
  return "Car{Manufacturer name:'" + getName() + "', Model Name:'" + getModelName() + "',
Type:'" + getType() + "'}";
}
}



package Assignment_4;


public interface Vehicle
 {
 int maxSpeed(String type);


}
```

```
package Assignment_4;
// vehicleservice class
public class VehicleService {
   public Car createCar(String name, String modelName, String type) {
      return new Car(name, modelName, type);
   }

   public Bike createBike(String name, String modelName, String type) {
      return new Bike(name, modelName, type);
   }

   public int compareMaxSpeed(Vehicle first, Vehicle second) {
      // Downcast to AbstractManufacturer to access getType()
      AbstractManufacturer firstManufacturer = (AbstractManufacturer) first;
      AbstractManufacturer secondManufacturer = (AbstractManufacturer) second;

      if (firstManufacturer.getType().equalsIgnoreCase("sports") &&
secondManufacturer.getType().equalsIgnoreCase("sports")){
         int firstSpeed = first.maxSpeed(firstManufacturer.getType());
         int secondSpeed = second.maxSpeed(secondManufacturer.getType());
         if (firstSpeed == secondSpeed){
            return 0;
         }
         return Math.max(firstSpeed, secondSpeed);
      }
      return -1;
   }
}
```

```
package Assignment_4;
public class Main {
    public static void main(String[] args) {
        VehicleService vehicleService = new VehicleService();


        Car car = vehicleService.createCar("Toyota", "Supra", "sports");
        Bike bike = vehicleService.createBike("Ducati", "Panigale", "sports");


        System.out.println(car.getManufacturerInformation());
        System.out.println(bike.getManufacturerInformation());


        int comparison = vehicleService.compareMaxSpeed(car, bike);
        if (comparison == 0) {
            System.out.println("Both vehicles have the same speed.");
        } else if (comparison > 0) {
            System.out.println("The faster vehicle has a speed of: " + comparison + " km/h");
        } else {
            System.out.println("The vehicles are not of the same type or not sports vehicles.");
        }
    }
}
```


eclipse-workspace2 - Assignments/src/Assignment_4/Main.java - Eclipse IDE
File Edit Source Refactor Source Navigate Search Project Run Window Help
Main.java
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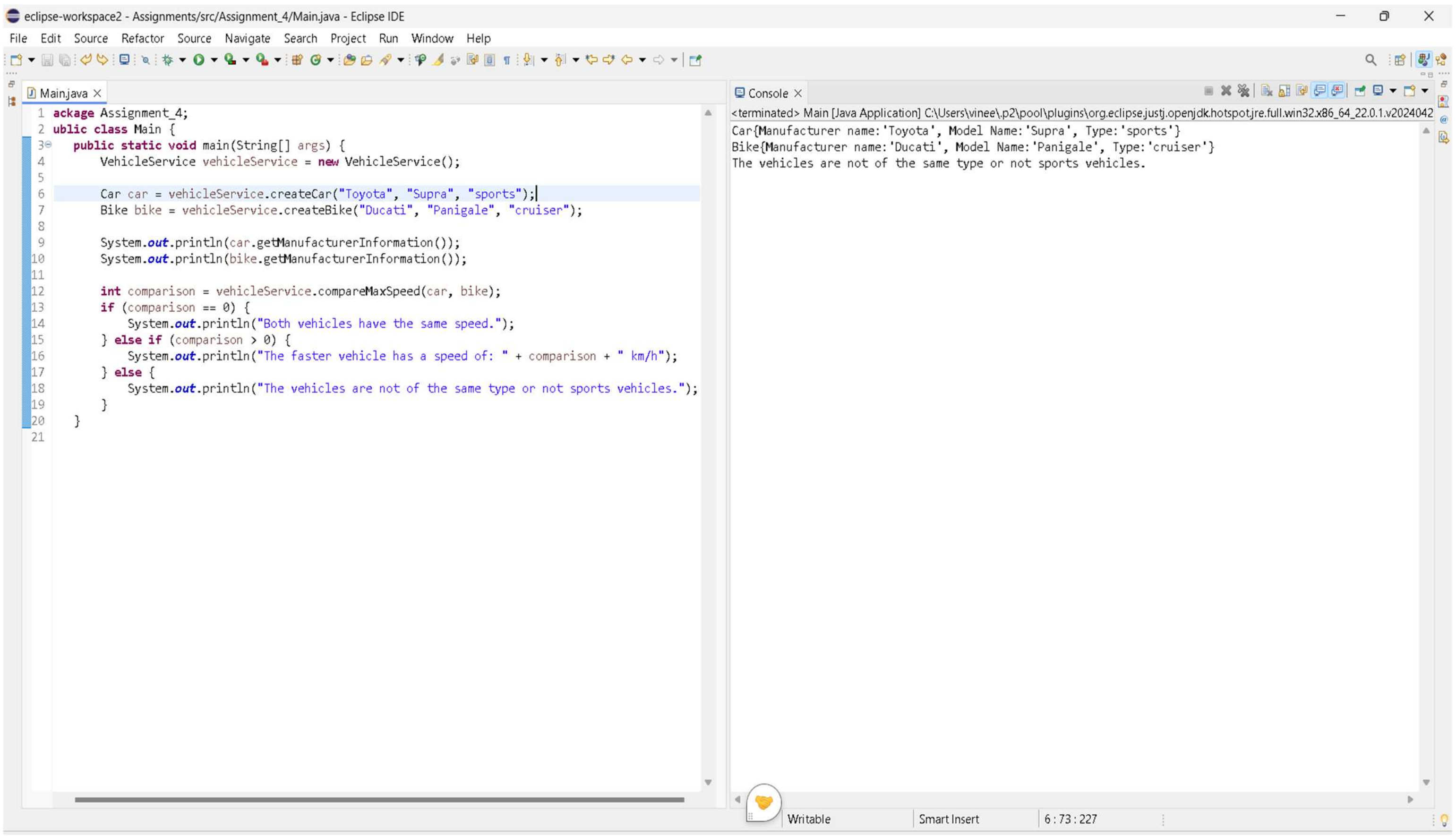
```java
ackage Assignment_4;
ublic class Main {
   public static void main(String[] args) {
       VehicleService vehicleService = new VehicleService();

       Car car = vehicleService.createCar("Toyota", "Supra", "sports");
       Bike bike = vehicleService.createBike("Ducati", "Panigale", "sports");

       System.out.println(car.getManufacturerInformation());
       System.out.println(bike.getManufacturerInformation());

       int comparison = vehicleService.compareMaxSpeed(car, bike);
       if (comparison == 0) {
           System.out.println("Both vehicles have the same speed.");
       } else if (comparison > 0) {
           System.out.println("The faster vehicle has a speed of: " + comparison + " km/h");
       } else {
           System.out.println("The vehicles are not of the same type or not sports vehicles.");
       }
   }
```

```
<terminated> Main [Java Application] C:\Users\vinee\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_22.0.1.v2024042
Car{Manufacturer name:'Toyota', Model Name:'Supra', Type:'sports'}
Bike{Manufacturer name:'Ducati', Model Name:'Panigale', Type:'sports'}
The faster vehicle has a speed of: 300 km/h
```


eclipse-workspace2 - Assignments/src/Assignment_4/Main.java - Eclipse IDE
File Edit Source Refactor Source Navigate Search Project Run Window Help
Main.java
Console
Writable
Smart Insert
6 : 73 : 227

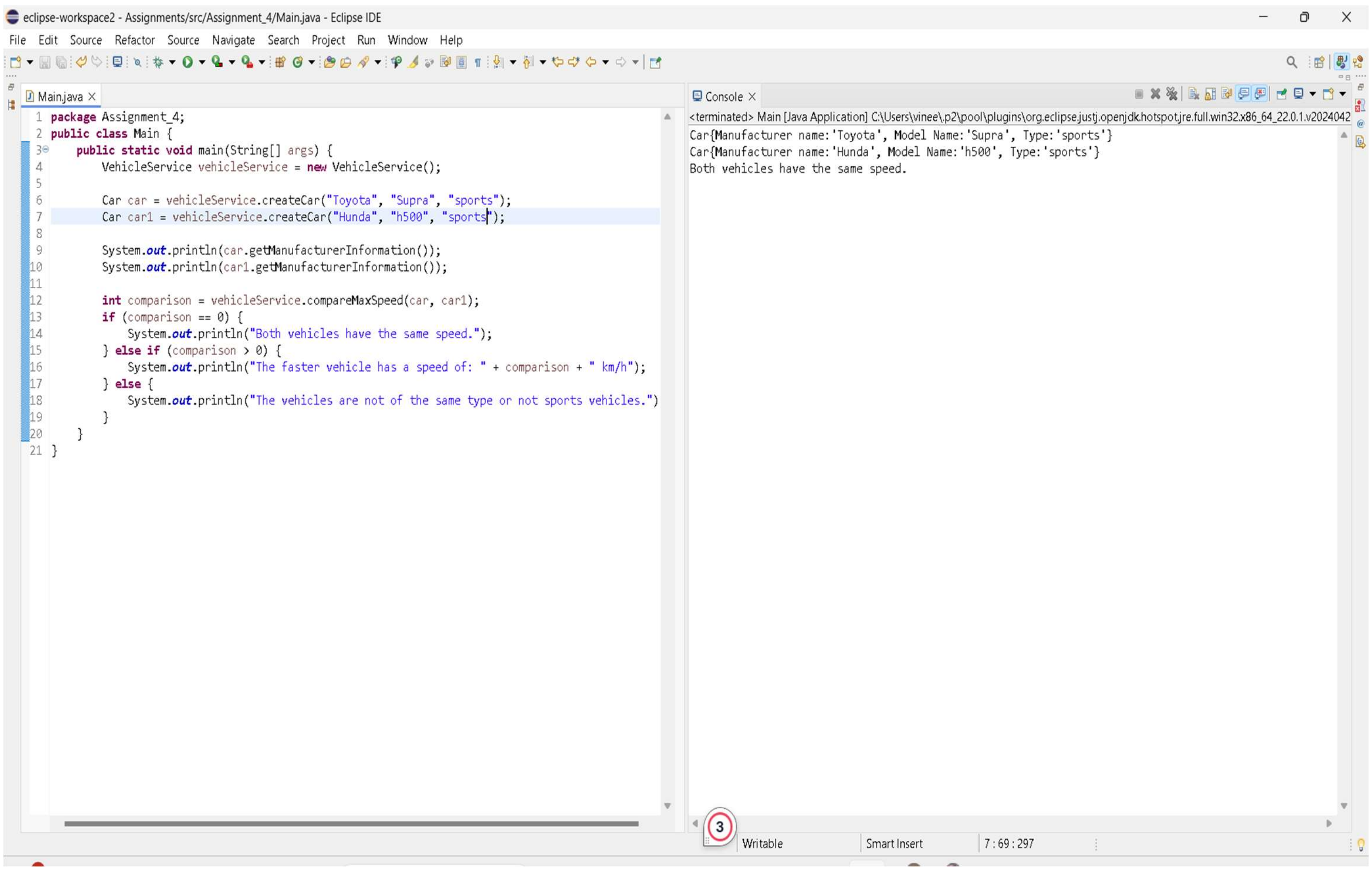
```java
ackage Assignment_4;
ublic class Main {
   public static void main(String[] args) {
       VehicleService vehicleService = new VehicleService();

       Car car = vehicleService.createCar("Toyota", "Supra", "sports");
       Bike bike = vehicleService.createBike("Ducati", "Panigale", "cruiser");

       System.out.println(car.getManufacturerInformation());
       System.out.println(bike.getManufacturerInformation());

       int comparison = vehicleService.compareMaxSpeed(car, bike);
       if (comparison == 0) {
           System.out.println("Both vehicles have the same speed.");
       } else if (comparison > 0) {
           System.out.println("The faster vehicle has a speed of: " + comparison + " km/h");
       } else {
           System.out.println("The vehicles are not of the same type or not sports vehicles.");
       }
   }
```

```
<terminated> Main [Java Application] C:\Users\vinee\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_22.0.1.v2024042
Car{Manufacturer name:'Toyota', Model Name:'Supra', Type:'sports'}
Bike{Manufacturer name:'Ducati', Model Name:'Panigale', Type:'cruiser'}
The vehicles are not of the same type or not sports vehicles.
```


eclipse-workspace2 - Assignments/src/Assignment_4/Main.java - Eclipse IDE
File Edit Source Refactor Source Navigate Search Project Run Window Help
Main.java
Console
3
Writable
Smart Insert
7 : 69 : 297

```java
package Assignment_4;
public class Main {
    public static void main(String[] args) {
        VehicleService vehicleService = new VehicleService();

        Car car = vehicleService.createCar("Toyota", "Supra", "sports");
        Car car1 = vehicleService.createCar("Hunda", "h500", "sports");

        System.out.println(car.getManufacturerInformation());
        System.out.println(car1.getManufacturerInformation());

        int comparison = vehicleService.compareMaxSpeed(car, car1);
        if (comparison == 0) {
            System.out.println("Both vehicles have the same speed.");
        } else if (comparison > 0) {
            System.out.println("The faster vehicle has a speed of: " + comparison + " km/h");
        } else {
            System.out.println("The vehicles are not of the same type or not sports vehicles.")
        }
    }
}
```

```
<terminated> Main [Java Application] C:\Users\vinee\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_22.0.1.v2024042
Car{Manufacturer name:'Toyota', Model Name:'Supra', Type:'sports'}
Car{Manufacturer name:'Hunda', Model Name:'h500', Type:'sports'}
Both vehicles have the same speed.
```