# Carbon Footprint Calculator - Java Source Code

This Java program calculates the carbon footprint for different modes of transportation, such as cars and bicycles. It demonstrates the use of interfaces and polymorphism in Java.

## Java Source Code

// Define an interface for Carbon Footprint calculation  
public interface CarbonFootprint {  
 double getCarbonFootprint();  
}  
  
// Implement Carbon Footprint for a Car  
public class Car implements CarbonFootprint {  
 private double averageYearlyMiles;  
 private double averageMPG;  
 private static final double CO2\_PER\_GALLON = 8.89; // in kg  
  
 public Car(double averageYearlyMiles, double averageMPG) {  
 this.averageYearlyMiles = averageYearlyMiles;  
 this.averageMPG = averageMPG;  
 }  
  
 @Override  
 public double getCarbonFootprint() {  
 return (averageYearlyMiles / averageMPG) \* CO2\_PER\_GALLON;  
 }  
}  
  
// Implement Carbon Footprint for a Bicycle  
public class Bicycle implements CarbonFootprint {  
 @Override  
 public double getCarbonFootprint() {  
 return 0; // Bicycles have negligible carbon footprint  
 }  
}  
  
// Main class to test Carbon Footprint calculations  
import java.util.ArrayList;  
  
public class CarbonFootprintTest {  
 public static void main(String[] args) {  
 ArrayList<CarbonFootprint> items = new ArrayList<>();  
  
 // Example: A car that drives 12,000 miles per year with 25 MPG  
 items.add(new Car(12000, 25));  
 items.add(new Bicycle());  
  
 // Calculate and display the carbon footprint of each item  
 for (CarbonFootprint item : items) {  
 System.out.println("Carbon Footprint: " + item.getCarbonFootprint() + " kg CO₂");  
 }  
 }  
}

## Expected Output

If the script is executed, the output will be:

Carbon Footprint: 4267.2 kg CO₂  
Carbon Footprint: 0.0 kg CO₂

## How to Run the Code

1. \*\*Using a Local Java Environment:\*\*

- Save each class in separate `.java` files (e.g., `Car.java`, `Bicycle.java`, `CarbonFootprint.java`, and `CarbonFootprintTest.java`).

- Compile the files using `javac`:

```  
 javac \*.java  
 ```

- Run the program:

```  
 java CarbonFootprintTest  
 ```

2. \*\*Using an Online Java Compiler:\*\*

- Copy and paste all the classes into an online compiler such as:

- [JDoodle](https://www.jdoodle.com/online-java-compiler)

- [Replit](https://replit.com/~)

- Click \*\*Run\*\* to see the output.