

# Folder Q4

5 printable files

(file list disabled)

Q4\Bicycle.java

```
1 package Q4;
2
3 public class Bicycle implements CarbonFootprint {
4     private int passengers;
5     private double kilometers;
6
7     public Bicycle(int passengers, double kilometers) {
8         this.passengers = passengers;
9         this.kilometers = kilometers;
10    }
11
12    public int getPassengers() {
13        return passengers;
14    }
15
16    public void setPassengers(int passengers) {
17        this.passengers = passengers;
18    }
19
20    public double getKilometers() {
21        return kilometers;
22    }
23
24    public void setKilometers(double kilometers) {
25        this.kilometers = kilometers;
26    }
27
28    @Override
29    public double getCarbonFootprint() {
30        return (0.021 * (passengers * kilometers));
31    }
32
33 }
34
```

Q4\Building.java

```
1 package Q4;
2
3 public class Building implements CarbonFootprint {
4     private double carbonoConstrucao;
5     private double usoAnualCarbono;
6     private int anosFuncionamento;
7
8     public int getAnosFuncionamento() {
9         return anosFuncionamento;
10    }
11
```

```

12     public void setAnosFuncionamento(int anosFuncionamento) {
13         this.anosFuncionamento = anosFuncionamento;
14     }
15
16     public Building(double carbonoConstrucao, double usoAnualCarbono, int
anosFuncionamento) {
17         this.carbonoConstrucao = carbonoConstrucao;
18         this.usoAnualCarbono = usoAnualCarbono;
19         this.anosFuncionamento = anosFuncionamento;
20     }
21
22     public double getCarbonoConstrucao() {
23         return carbonoConstrucao;
24     }
25
26     public void setCarbonoConstrucao(double carbonoConstrucao) {
27         this.carbonoConstrucao = carbonoConstrucao;
28     }
29
30     public double getUsoAnualCarbono() {
31         return usoAnualCarbono;
32     }
33
34     public void setUsoAnualCarbono(double usoAnualCarbono) {
35         this.usoAnualCarbono = usoAnualCarbono;
36     }
37
38     @Override
39     public double getCarbonFootprint() {
40         return ((carbonoConstrucao + (usoAnualCarbono * anosFuncionamento)) * 1000);
41     }
42
43 }
44

```

#### Q4\Car.java

```

1  package Q4;
2
3  public class Car implements CarbonFootprint {
4      private double kmPerLiter;
5      private int year;
6
7      public Car(double kmPerLiter, int year) {
8          this.kmPerLiter = kmPerLiter;
9          this.year = year;
10     }
11
12     public double getKmPerLiter() {
13         return kmPerLiter;
14     }
15
16     public void setKmPerLiter(double kmPerLiter) {
17         this.kmPerLiter = kmPerLiter;
18     }
19
20     public int getYear() {
21         return year;
22     }
23

```

```

23
24     public void setYear(int year) {
25         this.year = year;
26     }
27
28     @Override
29     public double getCarbonFootprint() {
30         //Calculated Carbon Footprint= Fuel Consumption (liter/100km = 100/kmPerLiter) x
Emission Factor, the emission of a gasoline car is 2,3 kg CO2/liter
31         return ((100/kmPerLiter) * 2.3);
32     }
33
34 }
35

```

#### Q4\CarbonFootprint.java

```

1  package Q4;
2
3  public interface CarbonFootprint {
4      public double getCarbonFootprint();
5  }
6

```

#### Q4\CarbonTest.java

```

1  package Q4;
2
3  import java.util.ArrayList;
4
5  public class CarbonTest {
6
7
8      public static void main(String[] args) {
9          Bicycle bicicleta = new Bicycle(2, 100);
10         Car carro = new Car(20, 2016);
11         Building construcao = new Building(50, 5, 5);
12
13         ArrayList<CarbonFootprint> gastos = new ArrayList<>();
14         gastos.add(bicicleta);
15         gastos.add(carro);
16         gastos.add(construcao);
17
18         gastos.forEach(consumo -> {
19             if (consumo instanceof Bicycle) {
20                 Bicycle bicicletaEsp = (Bicycle) consumo;
21                 System.out.println("Bicicleta andou " + bicicletaEsp.getKilometers() + "
km(s) com " + bicicletaEsp.getPassengers() + " passageiros");
22             } else if (consumo instanceof Car) {
23                 Car carroEsp = (Car) consumo;
24                 System.out.println("Carro de " + carroEsp.getYear() + " que faz " +
carroEsp.getKmPerLiter() + "km/l");
25             } else if (consumo instanceof Building) {
26                 Building construcaoEsp = (Building) consumo;
27                 System.out.println("Construção que gastou " +
construcaoEsp.getCarbonoConstrucao() + " toneladas de CO2 em sua construção e consome " +
construcaoEsp.getUsoAnualCarbono() + " toneladas de CO2 por ano, está em funcionamento há "
+ construcaoEsp.getAnosFuncionamento() + " anos!");
28             }
29         });
30     }
31 }

```

```
29         System.out.println("Pegada de Carbono: " + consumo.getCarbonFootprint() + "kg  
de CO2 gastos");  
30         System.out.println("-----");  
31     });  
32 }  
33 }  
34 }
```