FRONT-END

HTML code for a frontend form that allows users to enter their energy usage and travel data:

```
<!DOCTYPE html>
<html>
 <head>
  <title>Carbon Footprint Calculator</title>
 </head>
 <body>
  <h1>Carbon Footprint Calculator</h1>
  <p>Please enter your energy usage and travel data to calculate your carbon footprint.</p>

  <form method="post" action="calculateCarbonFootprint">
   <label for="electricityUsage">Electricity usage (kWh):</label>
   <input type="number" name="electricityUsage" id="electricityUsage"><br>

   <label for="naturalGasUsage">Natural gas usage (therms):</label>
   <input type="number" name="naturalGasUsage" id="naturalGasUsage"><br>

   <label for="propaneUsage">Propane usage (gallons):</label>
   <input type="number" name="propaneUsage" id="propaneUsage"><br>

   <label for="gasolineUsage">Gasoline usage (gallons):</label>
   <input type="number" name="gasolineUsage" id="gasolineUsage"><br>

   <label for="dieselUsage">Diesel usage (gallons):</label>
   <input type="number" name="dieselUsage" id="dieselUsage"><br>

   <label for="airTravelMiles">Air travel (miles):</label>
   <input type="number" name="airTravelMiles" id="airTravelMiles"><br>
```

```
    <input type="submit" value="Calculate">
  </form>
 </body>
</html>
```

This form includes six input fields for electricity, natural gas, propane, gasoline, diesel, and air travel data, along with a submit button that sends the form data to a server-side script for calculation of the carbon footprint.

BACK-END

Here is an example implementation that processes the form data and calculates the carbon footprint based on the user inputs:

JAVA CODE

```
import java.io.IOException;
import java.io.PrintWriter;

import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

@WebServlet("/calculateCarbonFootprint")
public class CarbonFootprintCalculator extends HttpServlet {
   private static final long serialVersionUID = 1L;

   public CarbonFootprintCalculator() {
      super();
```

```
    }

    protected void doPost(HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException {
        double electricityUsage = Double.parseDouble(request.getParameter("electricityUsage"));
        double naturalGasUsage = Double.parseDouble(request.getParameter("naturalGasUsage"));
        double propaneUsage = Double.parseDouble(request.getParameter("propaneUsage"));
        double gasolineUsage = Double.parseDouble(request.getParameter("gasolineUsage"));
        double dieselUsage = Double.parseDouble(request.getParameter("dieselUsage"));
        double airTravelMiles = Double.parseDouble(request.getParameter("airTravelMiles"));

        double carbonFootprint = calculateCarbonFootprint(electricityUsage, naturalGasUsage, propaneUsage, gasolineUsage, dieselUsage, airTravelMiles);

        // Generate output HTML
        PrintWriter out = response.getWriter();
        out.println("<!DOCTYPE html>");
        out.println("<html>");
        out.println("<head>");
        out.println("<title>Carbon Footprint Calculator Results</title>");
        out.println("</head>");
        out.println("<body>");
        out.println("<h1>Carbon Footprint Calculator Results</h1>");
        out.println("<p>Your estimated carbon footprint is: " + carbonFootprint + " metric tons of CO2e per year.</p>");
        out.println("</body>");
        out.println("</html>");
    }

    private double calculateCarbonFootprint(double electricityUsage, double naturalGasUsage, double propaneUsage, double gasolineUsage, double dieselUsage, double airTravelMiles) {
        // These values are based on average carbon emission factors for the US in 2021
```

```
        double electricityEmissionFactor = 0.498;
        double naturalGasEmissionFactor = 5.1;
        double propaneEmissionFactor = 12.7;
        double gasolineEmissionFactor = 8.92;
        double dieselEmissionFactor = 10.18;
        double airTravelEmissionFactor = 0.257;

        double carbonFootprint = (electricityUsage * electricityEmissionFactor)
                + (naturalGasUsage * naturalGasEmissionFactor)
                + (propaneUsage * propaneEmissionFactor)
                + (gasolineUsage * gasolineEmissionFactor)
                + (dieselUsage * dieselEmissionFactor)
                + (airTravelMiles * airTravelEmissionFactor);

        return carbonFootprint;
    }
}
```

Note that this implementation assumes that the form data is submitted via a POST request to the /calculateCarbonFootprint URL. Also, the carbon emission factors used in the calculateCarbonFootprint method are based on US averages for the year 2021, and may not be accurate for all locations and time periods

Firstly, the technology industry has a significant impact on the environment, and software development is one of the biggest contributors. With the increasing demand for technology and software, the energy consumption and carbon emissions produced by the industry have adverse effects on the environment and contribute to climate change.

Secondly, reducing the carbon footprint of software development can help organizations reduce their operating costs and improve their brand image. Consumers are increasingly conscious of the impact that companies have on the environment and are more likely to choose products and services from environmentally responsible companies.

Finally, building green software and reducing carbon footprint in software development is not only important for the environment and business but also a moral responsibility. It is essential to ensure that future generations have access to a sustainable and healthy environment, and reducing carbon emissions is a crucial step towards achieving that goal.