CS160 Final Project Requirements Documentation

Product Name: EcoSense

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INTRODUCTION:

EcoSense is a full-stack web application built to provide environmentally conscious individuals with tools and resources for guidance in sustainable living. It has 3 primary features that address different areas of a person's lifestyle and habits. The first is an interactive decision-tree format waste management quiz that teaches proper sorting of trash, recycling, compost, and specialty items. The second feature is a personalized carbon footprint calculator that factors in water and energy usage, transportation habits, and lifestyle choices to generate comprehensive emission scores for the user, displaying their results both verbally and visually. The final feature is a sustainability resource hub, which offers tips, tutorials, and further reading for users to access and learn more. By combining interactive learning with personal data-driven feedback and fostering knowledge among the user community, EcoSense raises awareness of individual environmental impacts, helps users integrate realistic eco-friendly habits into their daily lives, and drives waste reduction and carbon footprint reduction.

FEATURE REQUIREMENTS:

Waste Sorting Quiz:

Requirements: In our proposal, we aimed to build a front-end, decision-tree-driven quiz that would guide users through classifying common household trash items into recycling, compost, waste, or special disposal streams using yes/no questions. The logic was to be hard-coded (no database), cover the most frequently discarded materials (such as aluminum, cardboard, food waste), and present a clean layout with "Yes/No" buttons and a results screen explaining why a given bin is correct.
Delivered: The final quiz meets these expectations: it uses the hard-coded decision tree as specified, focuses on commonly used items, displays one question at a time in a responsive layout, and provides feedback on the disposal method.

Carbon Footprint Calculator:

Requirements: We defined a feature to collect user inputs on daily transportation (car, flight, public transit), diet, household energy (electricity, heating), and water usage, and to apply average CO_2-equivalent coefficients to output a personalized footprint along with suggestions for improvement and a comparison to the general population's emissions. The calculation logic and coefficients were to be hard-coded for simplicity, with form validation of only numeric entries, and results presented clearly. We also wanted to provide a basic visual to help users see their

contributions compared to the general baseline.
Delivered: The implemented calculator fulfills these requirements: all of the input fields render correctly and check for numeric data, the algorithm uses average emission factors to calculate and output the user's footprint, and we enhanced the results with a Chart.js pie chart for visual feedback. Our unit tests also confirmed that both the calculation and the display logic work independently and accurately.

Home/Info Page (Tip of the Day & Resources):

Requirements: Our original proposal described a "Tip of the Day" component that pulls randomly from a front-end array of 30–40 eco-tips to display for the user, and a categorized resources section linking to external sites on sustainable food, clothing, household goods, and similar topics. Both components were to be fully hard-coded and easily maintainable, requiring only simple randomization for tips and embedded links for the resources.
Delivered: The final home/info pages align with these specifications: the users click "New Tip" to cycle through a set of suggestions, and resource cards link to the external websites which provide additional knowledge on a range of topics. All functionality is in the front end as planned, with room to expand on the available tips or resource categories in the future.