Mini Project Report
on

EcoLife

For the course

Web Programming Laboratory

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DECLARATION

I declare that the written Mini Project report submission represents the work done based on my and / or others' ideas with adequately cited and referenced the original source. I also declare that I have adhered to all principles of academic honesty and integrity as per norms of the Somaiya Vidyavihar University. I have not misinterpreted, fabricated, or falsified any idea/data/fact/source/original work/matter in my submission.

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APPLICATION WEB DEVELOPMENT: ECOLIFE

EcoLife is a dynamic web application designed to promote sustainable living through the integration of informative tools and interactive features. The platform aims to raise awareness about individual carbon footprints and provide actionable steps toward reducing environmental impact.

Technology Stack Used

- **Frontend:** HTML, CSS, JavaScript
- **Backend:** PHP
- **AI Integration:** Gemini API (for chatbot functionality)
- **Database:** MySQL

Core Features and Functionality

1. **CO_2 Calculator:**
   Users input data related to daily activities such as transport, electricity use, and consumption habits. The application calculates their approximate carbon footprint and displays insights to help reduce it.

2. **AI Chatbot – 'EcoGuide':**
   Powered by the **Gemini API**, EcoGuide serves as a virtual sustainability guide. It answers user queries, gives eco-friendly tips, and provides educational content on sustainable living.

3. **Challenges – 'EcoQuests' :**
   An interactive module where users engage in eco-friendly tasks, track their EcoPoints, and visualize their environmental impact. With gamified features, progress tracking, and dynamic challenge filters, it motivates users to take meaningful climate action every day.

4. **User-Friendly Interface:**
   The UI is clean, responsive, and designed with an eco-theme. CSS styling ensures an engaging and intuitive user experience, while JavaScript handles interactive elements like form validation and dynamic content updates.

Frontend Development

- HTML structures the pages logically with semantic tags.
- CSS styles the application with green tones and minimalist layouts to reflect the environmental theme.
- JavaScript handles:
    - Input validation
    - Form submission
    - Displaying chatbot responses dynamically
    - Updating challenge progress in real-time

Backend Logic and Integration

- PHP manages backend processing, including:
    - Handling form data submissions
    - Communicating with the MySQL database to store and retrieve user inputs and challenge progress
    - Calling the Gemini API and formatting responses from the chatbot
- MySQL stores user data such as co_2_calculations, users, challenges and user_ challenges.

AI Chatbot Implementation

- User messages are sent to the **Gemini API** via a PHP script.
- Responses are fetched and displayed in the chatbox using JavaScript.
- The bot can handle sustainability queries, offer daily green living tips, and suggest personalized actions based on the user's interests.

GitHub

Repository Link

LITERATURE REVIEW

The EcoLife project is deeply rooted in the principles of **Sustainable Development Goal 13 [4]** , which urges all sectors of society to take immediate action against climate change and its detrimental effects. As environmental challenges become more complex, digital platforms like EcoLife provide an innovative response by translating awareness into action. Education, awareness, and personal responsibility form the bedrock of sustainable progress. Rosa highlights the transformative potential of educating individuals and communities to instil environmental mindfulness in daily choices. She underscores the necessity of integrating sustainability into lifestyle habits, particularly through accessible tools and platforms that empower individuals to take charge of their environmental footprint **[1].**

Furthermore**,** international climate agreements such as the **UNFCCC** and the **Paris Agreement** form a macro-level foundation for climate action, but they are most effective when accompanied by micro-level engagement. Lofts et al. argue that policy efforts need to be localized through public participation, education, and community-based initiatives. This aligns with EcoLife's mission to reach individuals where they are on their devices and in their routines offering personalized AI guidance, daily eco-tips**,** and interactive challenges that directly contribute to behaviour change **[3].**

From a scientific and technical perspective, the accuracy of environmental tracking is key to meaningful engagement. Pandey et al. discuss the importance of **quantifying carbon footprints** through comprehensive methodologies that include both direct and indirect emissions. They advocate for empowering individuals with data that can inform their decisions. This principle is integrated into EcoLife's **CO_2 emission calculator**, which is tailored to reflect common user activities and provide **real-time, actionable feedback [2]**.

By blending education, data-driven insights, and gamified challenges, EcoLife acts as a bridge between climate policy goals and individual responsibility **[5]**. It makes global issues locally actionable, translating dense climate discourse into engaging, practical experiences. The platform exemplifies how digital innovation can democratize climate action, enabling users to contribute meaningfully to a more sustainable future.

Thus, EcoLife not only draws on theoretical and policy frameworks but also embodies a practical application of climate change mitigation strategies as outlined in both scientific literature and international agreements **[1][2][3].**

NEED STATEMENT

EcoLife is a web-based application developed to empower individuals to take meaningful climate action by promoting awareness, education, and sustainable living. The project is aligned with **Sustainable Development Goal 13[4]** : Take urgent action to combat climate change and its impacts, aiming to bridge the gap between environmental knowledge and everyday behavior through interactive digital tools.

The platform offers key features such as a CO_2 emission calculator, an AI-powered chatbot that delivers personalized sustainability tips, and a gamified challenge system including activities like Zero Waste Week. Users earn EcoPoints, level up, and track their environmental impact through intuitive progress bars and visual indicators, such as water saved (in gallons), energy conserved (in kWh), and trees preserved.

EcoLife is designed to make climate action accessible, engaging, and measurable. By combining real-time feedback, educational content, and a user-friendly interface **[6]** , the application fosters behavior change and deepens users' understanding of their personal carbon footprint. The project leverages modern web technologies to encourage a more sustainable lifestyle through everyday actions.

Through its integration of education, gamification, and impact tracking, EcoLife acts as a digital catalyst for eco-conscious living, helping individuals make informed choices and actively contribute to the global effort against climate change.

OBJECTIVES

To achieve the goals and vision of the EcoLife application, the following objectives have been defined:

- **Promote environmental awareness**

  Develop a platform that educates users about climate change, carbon emissions, and sustainable living in an engaging and interactive manner.

- **Encourage measurable climate action**

  Enable users to track and reduce their personal carbon footprint using a CO_2 emission calculator tailored to everyday activities.

- **Integrate AI-driven sustainability guidance**

  Provide users with tips and eco-friendly practices through an AI-powered chatbot, making learning about sustainable choices easier and more accessible.

- **Gamify sustainable behavior**

  Motivate users through challenges, EcoPoints, levels, and impact visualizations turning environmental responsibility into a fun and rewarding experience.

- **Visualize real-time environmental impact**

  Display metrics such as water saved, energy conserved, and equivalent trees protected, helping users understand the tangible results of their actions.

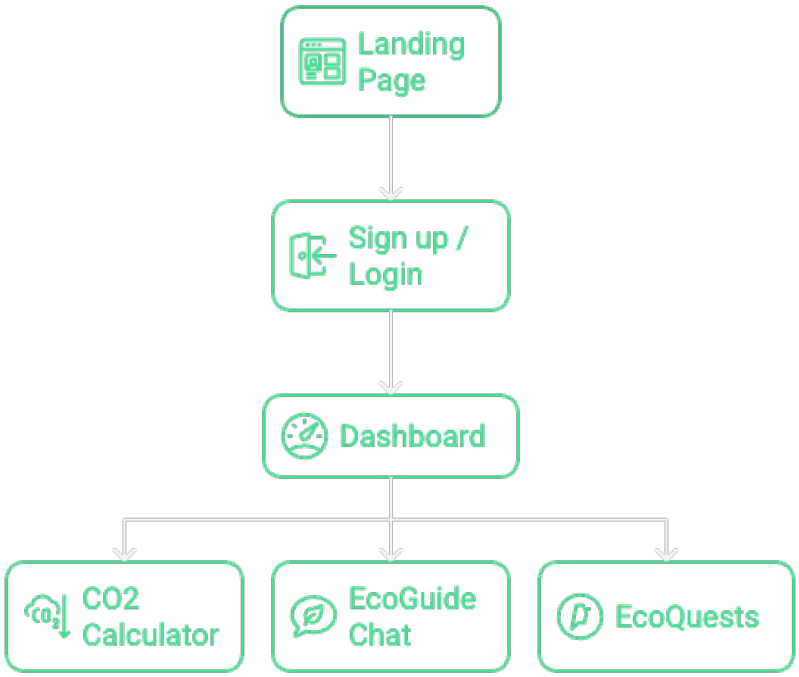
- **Create a responsive and user-friendly interface**

  Design a clean, intuitive layout with mobile-friendly responsiveness, smooth transitions, and accessible navigation to ensure ease of use across devices.

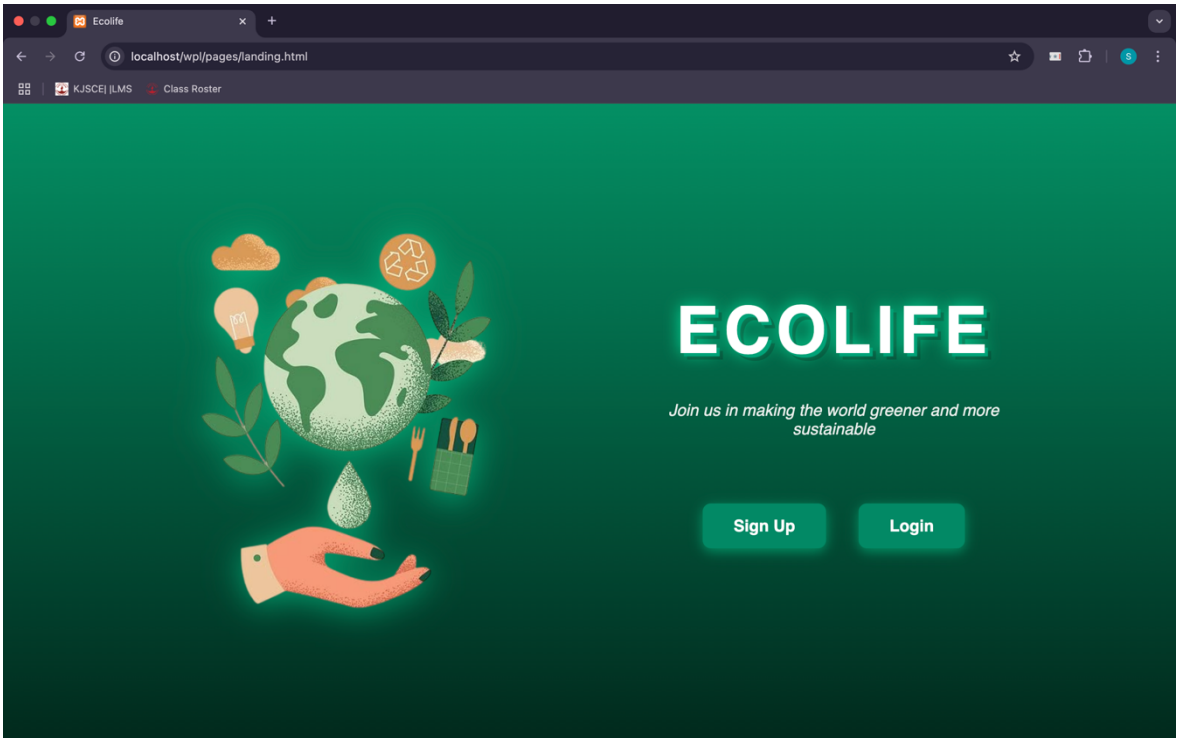
- **To support SDG 13: Climate Action**

  Align all features of the application with the goals of SDG 13 by fostering education, promoting behavior change, and supporting global climate mitigation efforts.

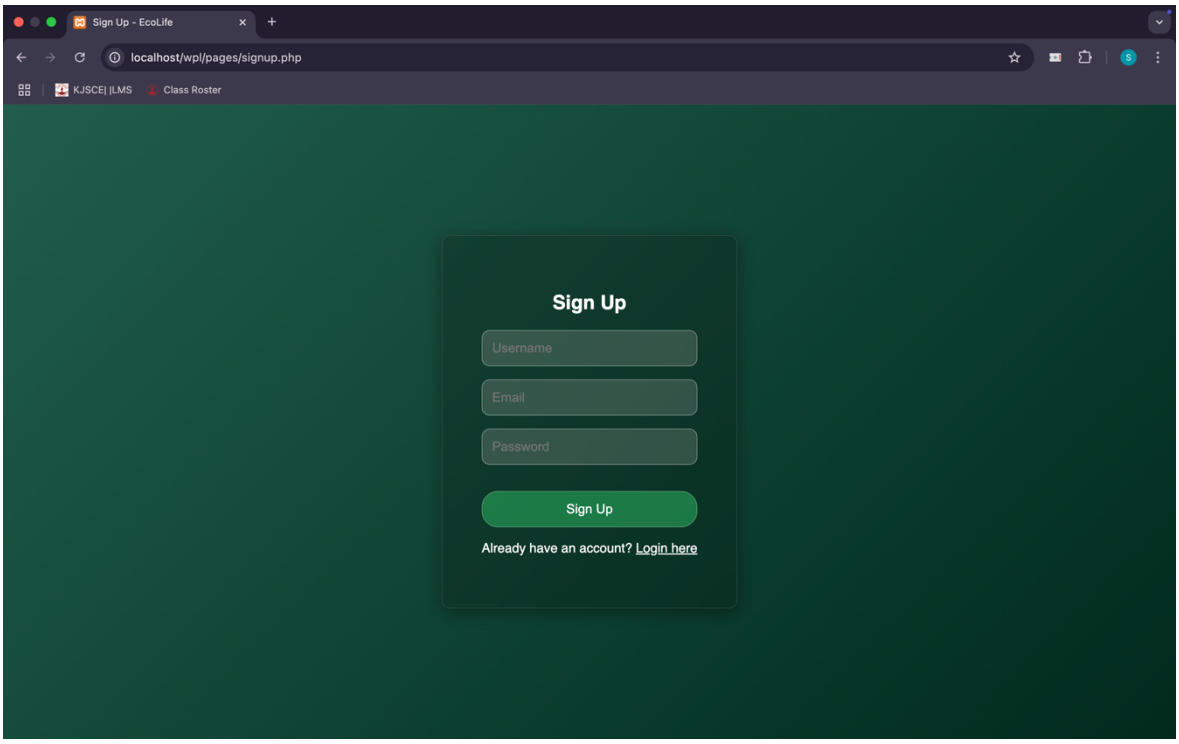
FLOW OF PAGES

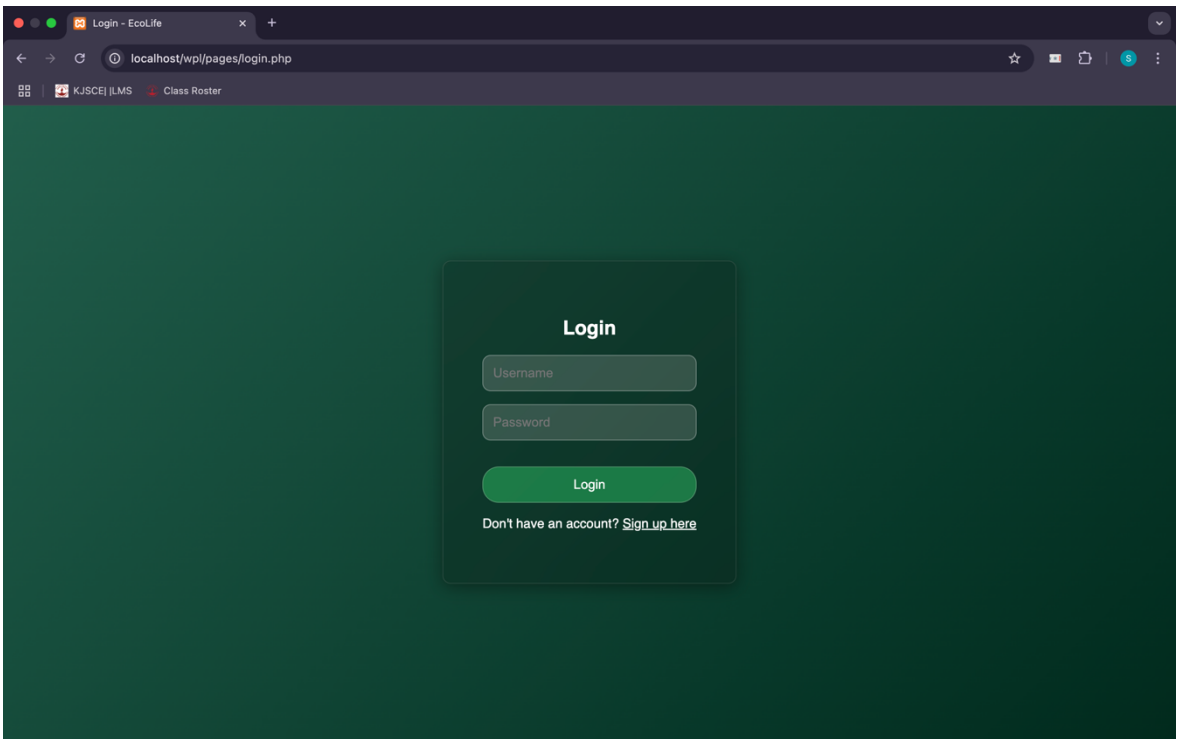


1. Landing Page

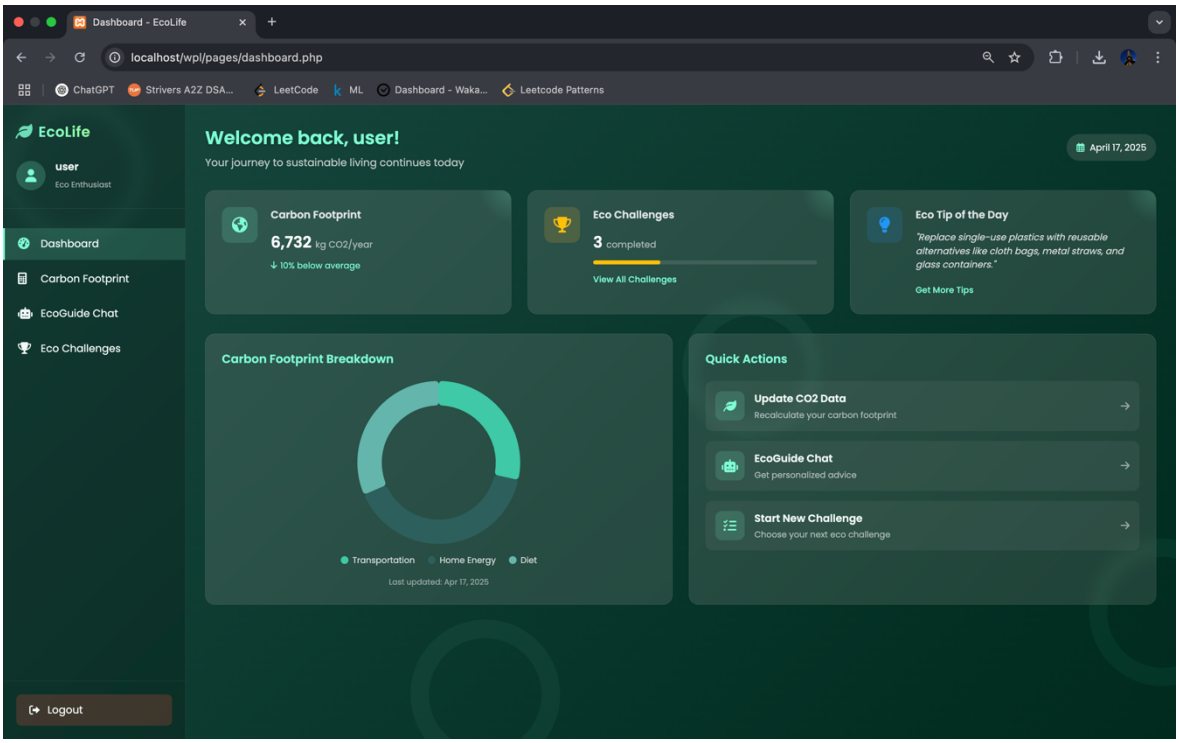


2. Sign up / Login

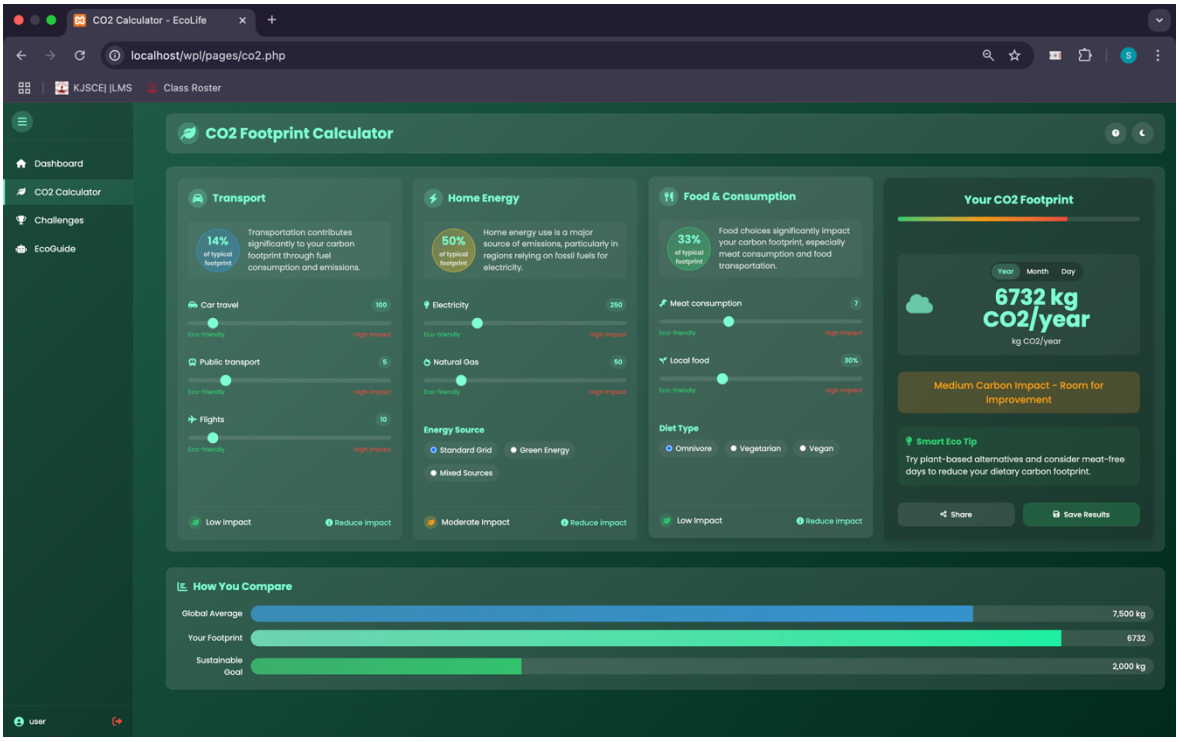




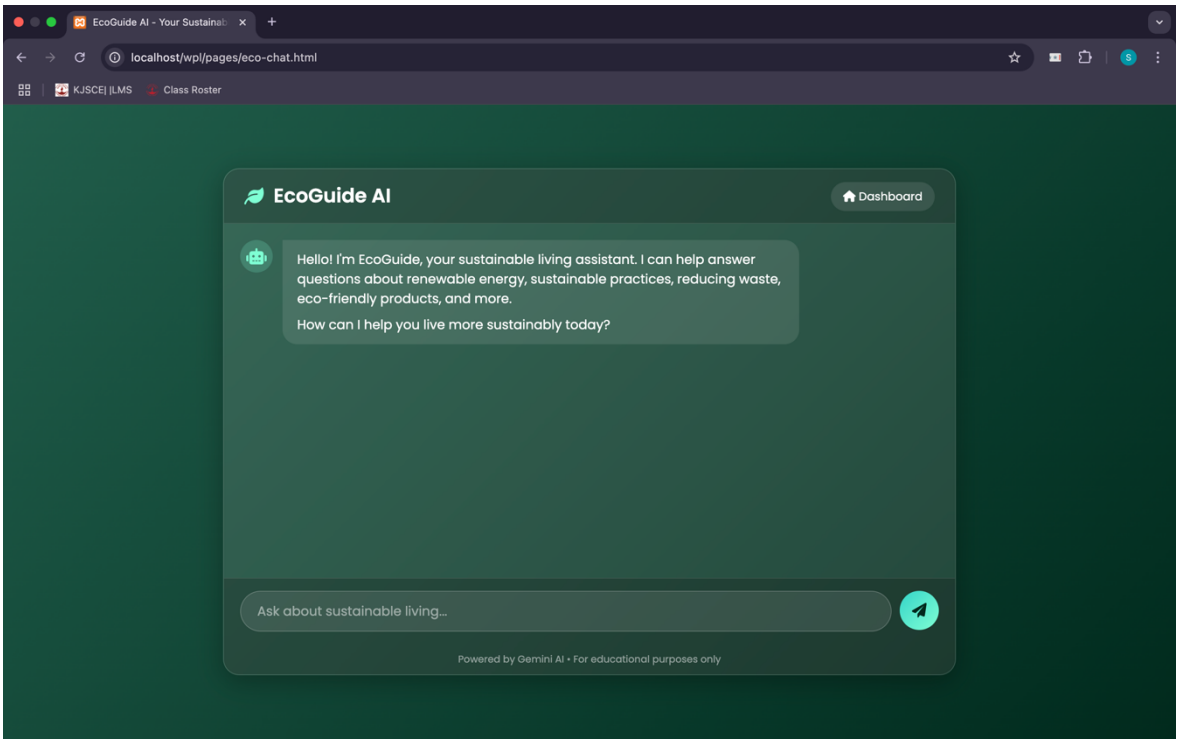
3. Dashboard



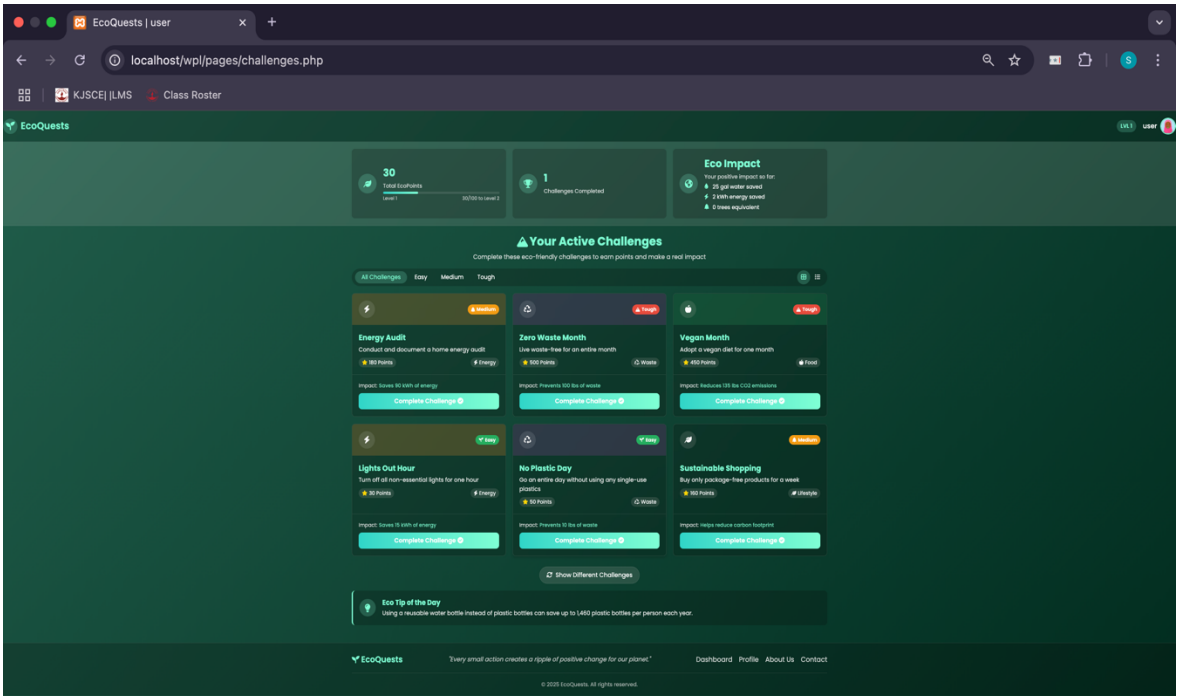
4. CO_2 Calculator



5. EcoGuide Chat

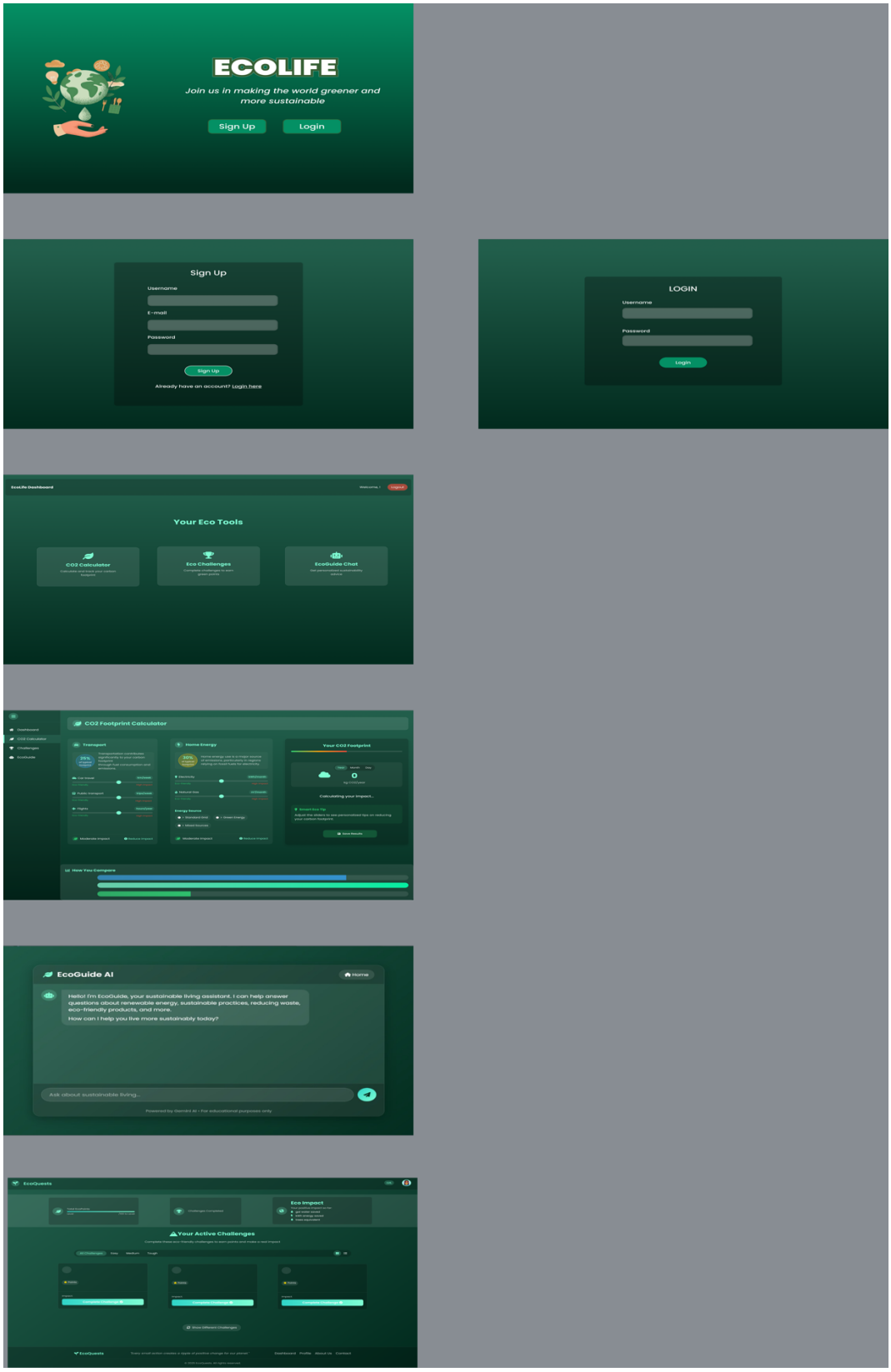


6. EcoQuests



FIGMA

[Figma Link]



DATABASE SCHEMA

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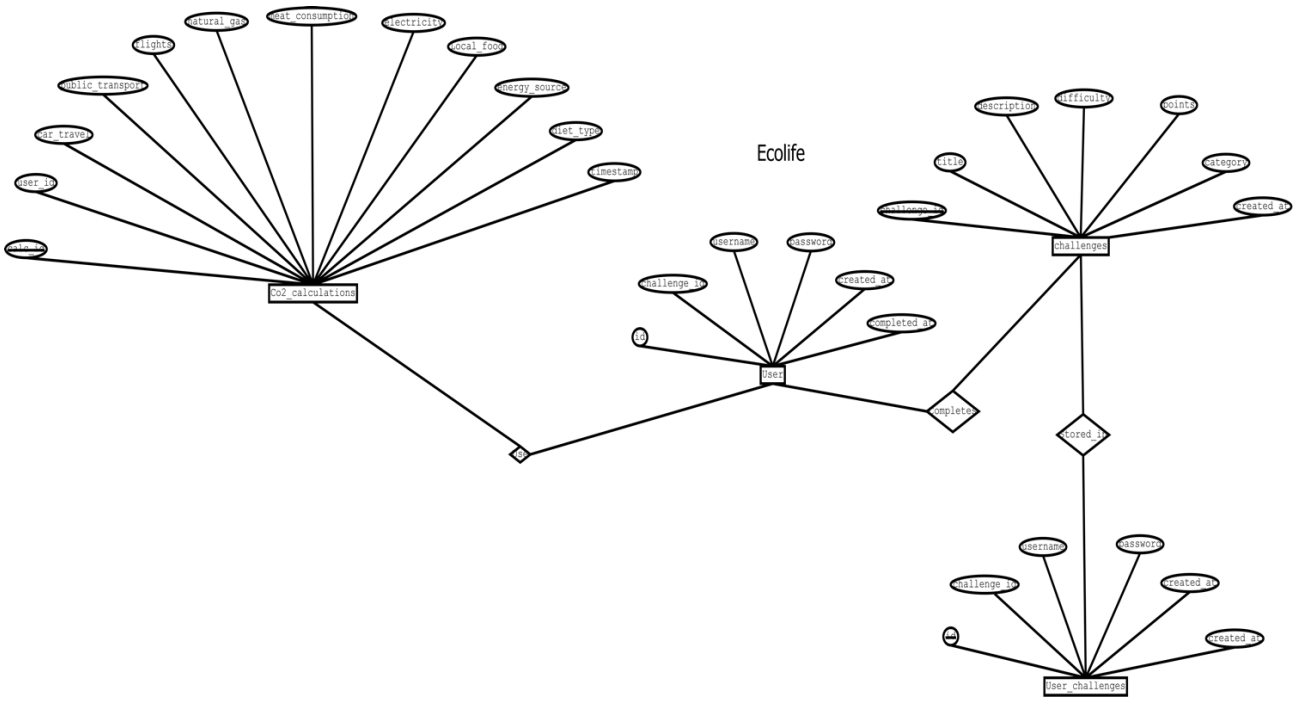

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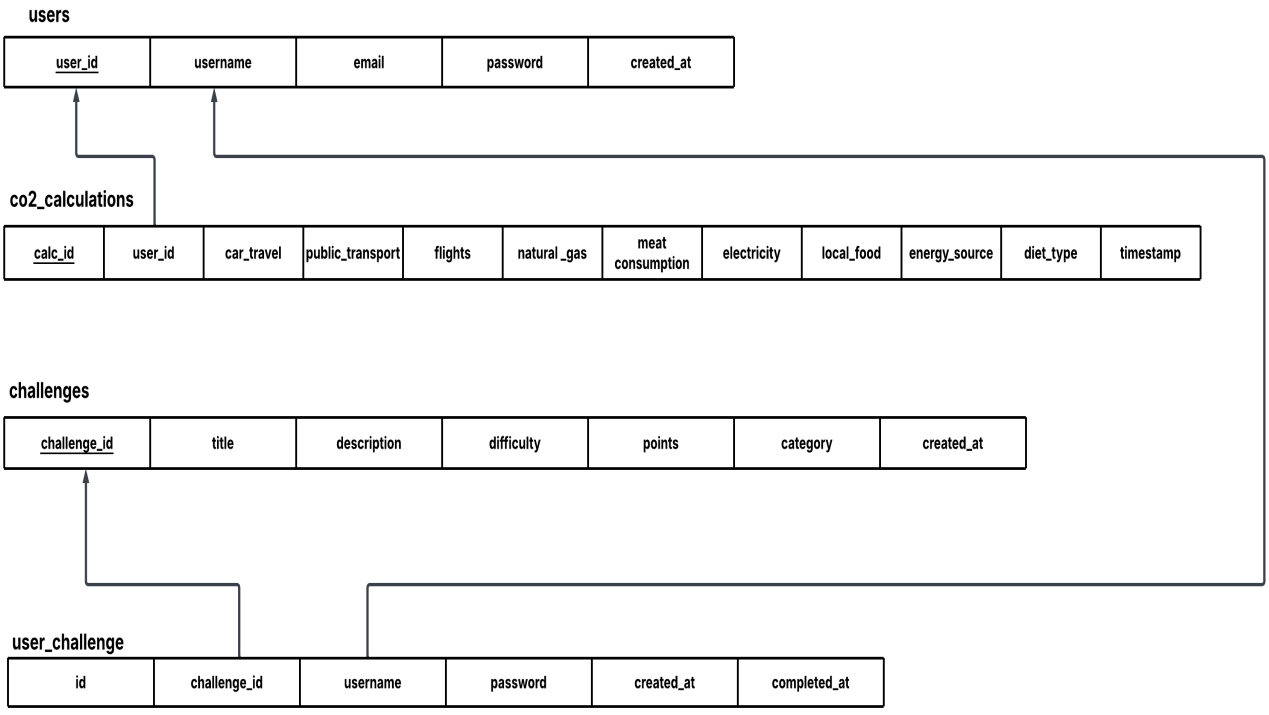

CONCLUSION

EcoLife represents a meaningful fusion of technology, sustainability, and user engagement serving as a practical tool to promote climate-conscious behavior in everyday life. Through features like a **CO_2 emission calculator**, an **AI-powered chatbot for eco-guidance**, and **interactive challenges**, the application empowers users to take measurable and impactful steps toward a more sustainable lifestyle.

By integrating educational content with gamified experiences and real-time environmental impact metrics, EcoLife transforms abstract climate data into something personal and actionable. Users not only learn about climate change but are encouraged to adopt habits that directly reduce their carbon footprint. The use of EcoPoints, progress levels, and visual feedback helps maintain motivation and builds a sense of accomplishment.

This project directly aligns with **Sustainable Development Goal 13: Climate Action**, contributing to the global effort to combat climate change through individual awareness and behavioral change. It demonstrates how digital platforms can play a powerful role in bridging the gap between knowledge and action.

Ultimately, **EcoLife** is a small yet significant step toward a greener future—encouraging individuals to take responsibility, act consciously, and contribute to a healthier planet.

FUTURE SCOPE

While EcoLife currently offers a strong foundation for promoting sustainable living through interactive tools and awareness, there are several opportunities to expand and enhance its functionality in the future:

- **Community and Social Features**
  Enable users to form eco-communities, participate in group challenges, and share achievements fostering a sense of collective responsibility and friendly competition.

- **Advanced Analytics and Insights**
  Provide users with detailed insights into their behavior patterns, historical trends in their carbon footprint, and monthly or yearly reports to visualize long-term impact.

- **Integration with Smart Devices**
  Expand the application to sync with fitness apps, smart home devices, or transport data to automatically track eco-friendly behaviors like cycling, energy savings, and more.

- **Rewards and Partnerships**
  Collaborate with eco-conscious brands to offer real-world rewards for completing challenges, redeemable using EcoPoints, thereby increasing user motivation.

- **Localized Challenges and Tips**
  Customize challenges and chatbot recommendations based on regional environmental concerns, seasons, or local sustainability practices.

- **Multi-language Support**
  Add support for multiple languages to make the platform accessible to a more diverse, global audience.

In the future, **EcoLife** has the potential to expand by incorporating social features, community challenges, personalized sustainability goals, and deeper analytics to track long-term behavior change. With continuous development, the application can become a vital tool in environmental education and grassroots climate action.

ACKNOWLEDGEMENT

We would like to express our sincere gratitude to Mrs. Bharati Narayan, our Web Programming Lab instructor, for her constant support, expert guidance, and encouragement throughout the development of our mini project. Her insightful suggestions and clear explanations helped us overcome challenges and refine our ideas, and we are truly thankful for her mentorship.

Our project, “EcoLife,” is a meaningful initiative aligned with the United Nations Sustainable Development Goal 13: “Take Urgent Action to Combat Climate Change and Its Impacts.” It leverages the power of technology, education, and interactive tools to promote sustainable living and climate awareness.

EcoLife includes features like a CO_2 calculator to help users track their emissions, an AI chatbot offering eco-friendly tips, and engaging challenges such as Zero Waste Week to motivate conscious lifestyle changes. Through this, we hope to empower individuals to take actionable and measurable steps in reducing their environmental footprint.

This project was also a true exercise in teamwork and collaboration. Each team member brought unique skills and perspectives to the table whether it was designing interfaces, developing backend logic, integrating APIs, or brainstorming innovative features. We learned the importance of communication, coordination, and adaptability in a team setting, and this experience has greatly enriched our technical as well as interpersonal skills.

We are immensely proud of what we have built together, and we are grateful for the opportunity to apply our classroom learning to a project with real-world relevance and impact.

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