Kathir College of Engineering
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[Approved by AICTE | Affiliated to Anna University | Accredited by NAAC with 'A+' Grade]
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INTERNSHIP REPORT

MVP TO AI-POWERED APPS: FOR THE MODERN WEB BUILDERS
BOREDOM LLP TECHNOLOGIES

PROJECT TITLE : ECOAI: SMART CARBON TRACKER & PERSONAL SUSTAINABILITY COACH

SUDMITTED BY

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REG NO : 711623243032

DEPARTMENT : B.TECH ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

BATCH : 2025-2026

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BONAFIDE CERTIFICATE

Certified that this Internship in MVP to AI-Powered Apps: For the Modern Web Builders is being carried out by NAGARAJ M (711623243032) of III-year B.tech Artificial Intelligence And Data Science. who carried out the project work under my supervision during the Summer Internship - AD3512 of Semester V.

SUBMISSION DATE_____

SUPERVISOR SIGNATURE **HOD SIGNATURE**

INTERNAL EXAMINER **EXTERNAL EXAMINER**

INTRODUCTION

About EcoAI Sustainability Project: EcoAI is an intelligent sustainability tracking platform that empowers users to monitor their environmental impact and receive AI-generated suggestions for greener habits. It aims to increase awareness and support eco-conscious decision-making using technology.

Modules of the Project:

User Interaction Module
Collects user queries and tracks activity.
Eco Suggestion Engine
Provides AI-generated sustainability tips using OpenAI's API.
Analytics & Insights
Displays real-time stats on usage and sustainability metrics via Vercel Analytics.
Storage & History
Uses Firebase Firestore and Storage for saving queries and related files/images.

Components & API Integration:

Components:
Banner, Footer, Avatar, EcoSuggestions, SideAnimations
APIs Used:
OpenAI GPT for intelligent responses
Firebase for database and storage
Vercel for deployment and analytics

Tech Stack (Next.js App):

Frontend: Next.js 15.3, Tailwind CSS
Backend: API Routes(app/api/ask/route.ts)
Deployment: Vercel
Database: FirebaseFirestore

Module -1 Landing Page Design & Github Deployment

Points Learned in the Module:

In this module, I learned the fundamentals of front-end web development, including HTML structure, CSS styling, and user interface design. I explored how to build a responsive and visually appealing landing page using sections like headers, hero content, images, and footers. I also gained experience working with buttons, background shapes, and layout enhancements to improve user engagement. Additionally, I learned the importance of semantic HTML, accessibility, and clean design. The deployment process taught me how to use GitHub to host a live website, manage version control, and share projects online using GitHub Pages.

Changes Made to the Code:

I made several changes to enhance the landing page for EcoAI. I added a clean HTML structure with header, body, and footer elements, then styled them using CSS for a modern look. I included background gradients, decorative shapes (circles, squares), and responsive layout styling. I integrated an image with size control and added interactive buttons with hover effects. A second footer line was added to credit the creator. Additionally, I updated text content and ensured everything was responsive for different screen sizes. These changes improved visual appeal and user experience, preparing the project for deployment on GitHub Pages.

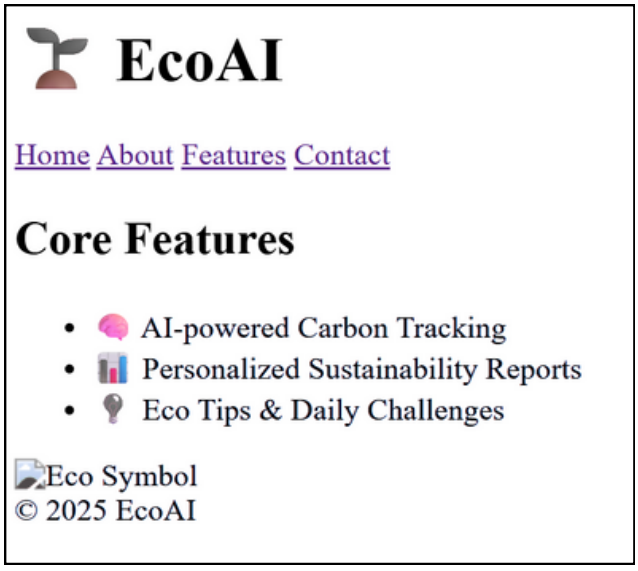
Module -2 Nextjs code and Vercel Deployment

Points Learned in the Module:

In this module, I learned how to set up and build applications using Next.js, a powerful React-based framework. I explored both routing systems—Pages Router and App Router—for creating multi-page applications. I learned how to add components, import CSS using global and module styles, and structure pages using JSX. Additionally, I discovered how Next.js handles server-side rendering and static site generation. Finally, I gained practical experience with deploying projects to Vercel, Next.js's hosting platform, which supports one-click deployments, automatic CI/CD, and custom domain configurations, enabling seamless and scalable application hosting for production-ready apps.

Changes Made to the Code:

To prepare the project for deployment on Vercel, I updated the code by organizing pages using the App Router in the app/ directory, adding new pages like About and Contact using page.tsx files. I applied styling using CSS Modules and ensured responsive design. I modified the next.config.js file for base path configuration (if needed) and verified image optimization settings. Additionally, I cleaned up unused imports and simplified navigation using <Link> components. After pushing the code to GitHub, I linked the repository to Vercel, configured environment variables, and successfully deployed the app with automatic updates on each new commit



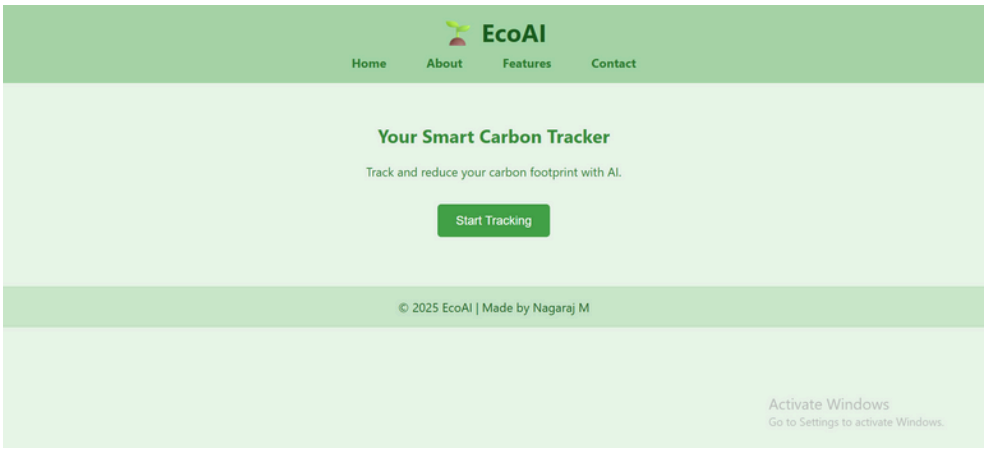
Module -3 Nextjs components

Points Learned in the Module

In this module, I learned how to buildamodernweb application using Next.js with a strong emphasis on component-based architecture.Iexplored how to create reusable UI components like headers, forms, andherosections. I gained an understanding of routing using the App Router, managing statewithuseState, and handling side effects with useEffect. Additionally, I learned howtostylecomponents using Tailwind CSS and import images from the public directory. Thismodulealso helped me understand layout composition in Next.js using a sharedlayout.tsxfile and client/server component distinction for optimal performance.

Changes Made to the Code

I restructured the Next.js project using the App Router by organizing pages into folders (/home, /about, /contact) with page.tsx files. I created reusable components in a separate /components folder, such as Navbar, Hero, and ContactForm. I used useState to manage interactive elements like form inputs and button clicks, and applied useEffect for lifecycle behavior. The global layout was centralized in layout.tsx to maintain consistent design. Tailwind CSS was integrated for responsive styling, and images were imported using the Next.js Image component from the /public/images folder to optimize loading and performance.



Module -4 MVP Design and Backend API

Points Learned in the Module :

This module provided practical knowledge on building modern web applications using **Next.js**, focusing on server-side rendering, component reusability, and routing. I learned to structure projects using modular components for scalability. API integration was a core part, including communication with **Firebase** for data storage and **OpenAI** for AI-driven responses. I also gained insights into deploying applications with **Vercel**, managing cloud functions, and monitoring usage with **Vercel Analytics**. Styling with Tailwind CSS and animating components using libraries like Framer Motion enhanced the UI/UX. Git and GitHub were used for version control, with emphasis on clean commit practices and deployment workflows.

Changes Made to the Code :

Key changes include redesigning the layout with a persistent **eco-themed banner**, footer section with images and text for eco suggestions, and global styling using Tailwind CSS. I deleted unused components and modularized layout elements like avatars and side animations. Firebase was integrated to log prompts and AI responses. The backend API routes were updated in route.ts to fetch content from OpenAI dynamically. UI responsiveness was improved with Flexbox and Grid utilities. Animation components were added for smoother transitions. Image assets were aligned at the page bottom with content. Code was pushed and deployed to Vercel from GitHub.

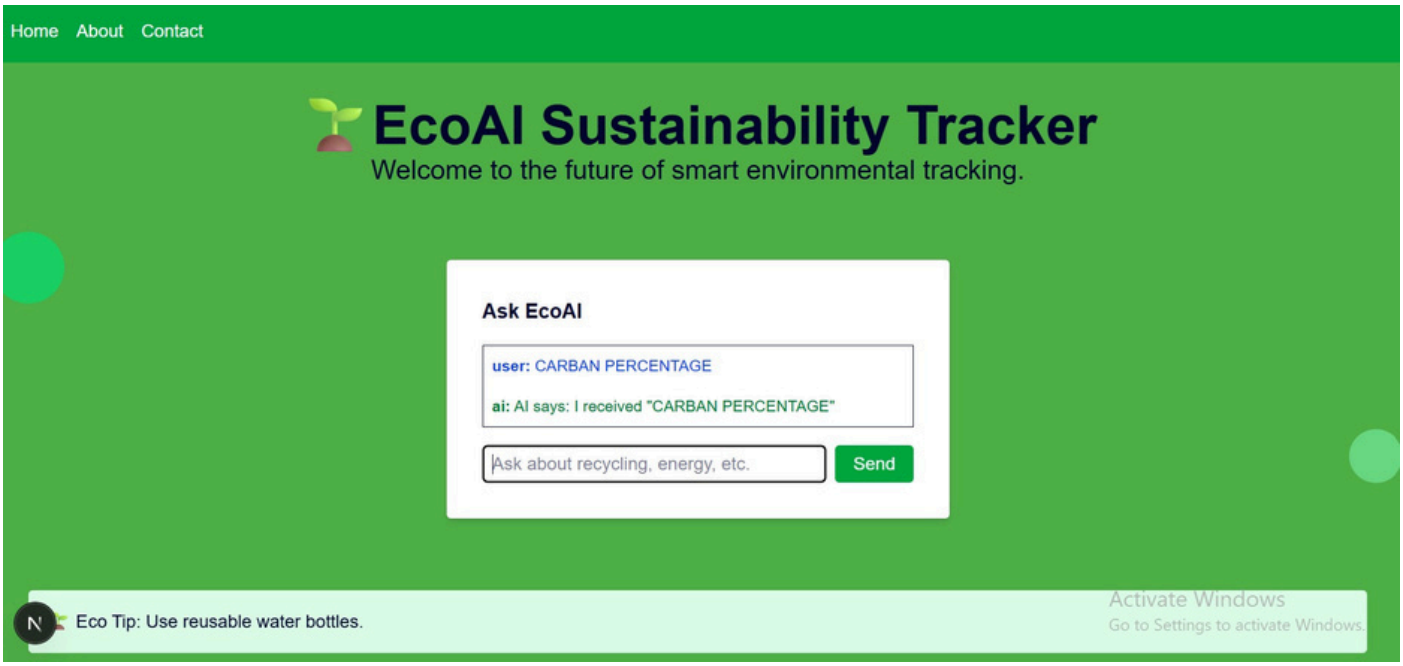
MVP Design for One of the Modules Module Name: Eco Suggestion Assistant

Goal: Deliver AI-generated eco-friendly lifestyle tips based on user prompts.

MVP Features:

Text input for users to ask eco-related questions.
Firebase stores queries and AI responses.
OpenAI API provides context-aware answers.

API REACT-AI



CARBON CALCULATOR:

Module -5 Storage Services and Analytics

Integration of Firebase Storage and Vercel Analytics

Firebase Storage Integration To enable file upload and retrieval in the **Eco AI Trackers** project, Firebase Storage was integrated as a secure and scalable solution:

Setup:
- o Firebase project was created and configured.
- o Firebase SDK was installed using npm install firebase.
- o Firebase config credentials (API key, project ID, etc.) were stored in environment variables.

Code Integration:
- o Firebase was initialized in a firebase.ts file.
- o uploadBytes, getDownloadURL, and ref functions from firebase/storage were used to handle file uploads.
- o Files uploaded by users (e.g., sustainability reports or sensor data) are stored in a structured path inside Firebase Storage.

Use Cases:
- o Uploading and storing CSV/JSON reports.
- o Fetching files for further analysis or display in the dashboard.

Benefits:
- o Auto-scaling, secure access, and fast CDN delivery of files.
- o Simplified file management and permissions via Firebase Console.

Vercel Analytics Integration To track the performance and user engagement of the deployed app, Vercel Analytics was enabled:

Setup:
- o Analytics was activated from the **Vercel Project Dashboard → Analytics Tab → Enable Analytics**.
- o No code changes were required as Vercel supports Next.js natively.

Features Used:

Real-time Traffic Monitoring: Tracks live user visits per route.

Page Performance: Reports on page load times, TTFB (Time to First Byte), and other metrics.

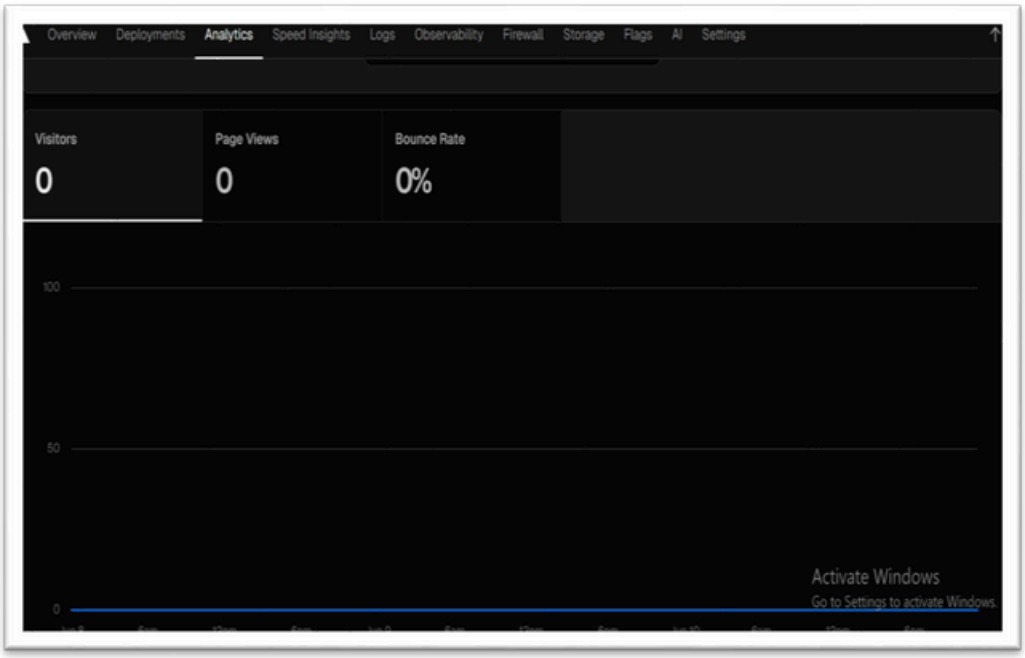
FIREBASE:

```
// lib/firebase.ts import { initializeApp } from
"firebase/app"; import { getFirestore } from
"firebase/firestore"; import { getStorage } from
"firebase/storage";


const firebaseConfig = {
  apiKey: process.env.NEXT_PUBLIC_FIREBASE_API_KEY, authDomain:
  process.env.NEXT_PUBLIC_FIREBASE_AUTH_DOMAIN, projectId:
  process.env.NEXT_PUBLIC_FIREBASE_PROJECT_ID, storageBucket:
  process.env.NEXT_PUBLIC_FIREBASE_STORAGE_BUCKET, messagingSenderId:
  process.env.NEXT_PUBLIC_FIREBASE_MESSAGING_SENDER_ID, appId:
  process.env.NEXT_PUBLIC_FIREBASE_APP_ID,
};


const app = initializeApp(firebaseConfig);
export const db = getFirestore(app); export
const storage = getStorage(app);
```

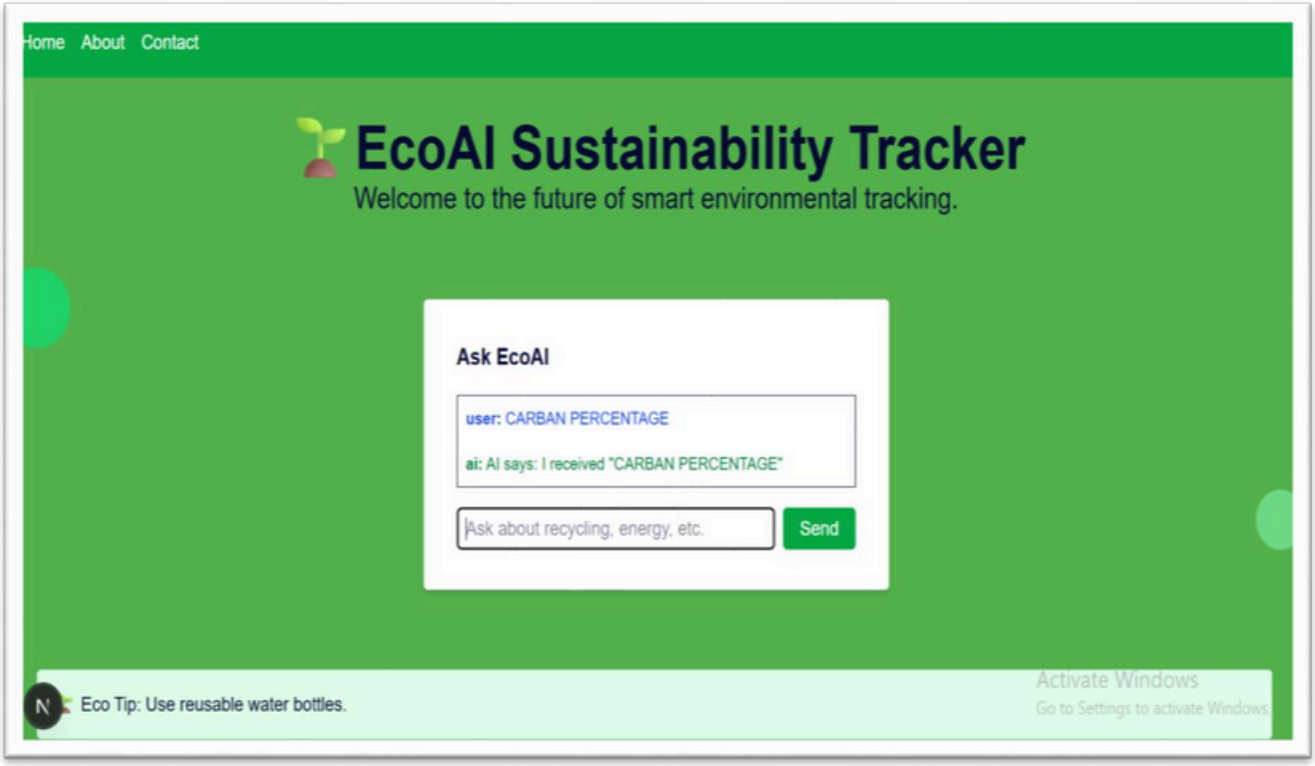
FIREBASE USING ENVIRONMENT VARIABLE
VERCEL ANALYTICS

FIREBASE STORAGE AND ANALYTICS

Vercel analytics:



Website outcome:



INTERNSHIP OUTCOME:

The MVP - Modern Web Developing internship offered a comprehensive introduction to modern web technologies and practical development workflows. Throughout the program, we gained hands-on experience with key tools and frameworks essential in today's web industry, such as HTML, CSS, JavaScript, and modern front-end libraries. The sessions helped us understand the structure of responsive web design and how to build dynamic, user-friendly websites.

One of the major takeaways was learning how to work with version control systems like Git and GitHub, vercel which are critical for collaborative development. We also explored backend integration and API handling, which provided insights into full-stack development processes. The internship emphasized best practices in coding, debugging, and UI/UX principles, which greatly improved our technical thinking and problem-solving abilities.

Under the guidance of Alwin Sir, we developed not only technical skills but also improved our teamwork, communication, and project management abilities. Real-time project work enhanced our confidence in applying what we learned in practical scenarios. Overall, the internship bridged the gap between academic knowledge and industry expectations, preparing us for future professional roles in web development.

Future Directions

1. **Personalized Eco Recommendations**

   Enhance AI suggestions using user history and preferences to deliver more accurate, personalized sustainability tips.

2. **Real-Time Data Integration**

   Integrate APIs for real-time environmental data (like air quality, energy use) to generate context-aware insights.

3. **Mobile App Version**

   Develop a responsive mobile application using React Native or Flutter for wider accessibility and usage on the go.

4. **Gamification Features**

   Introduce a points system, challenges, and rewards for eco-friendly actions to improve user engagement and motivation.

5. **Community Forum Integration**

   Create a space for users to share eco-tips, ask questions, and support each other in sustainable living practices.

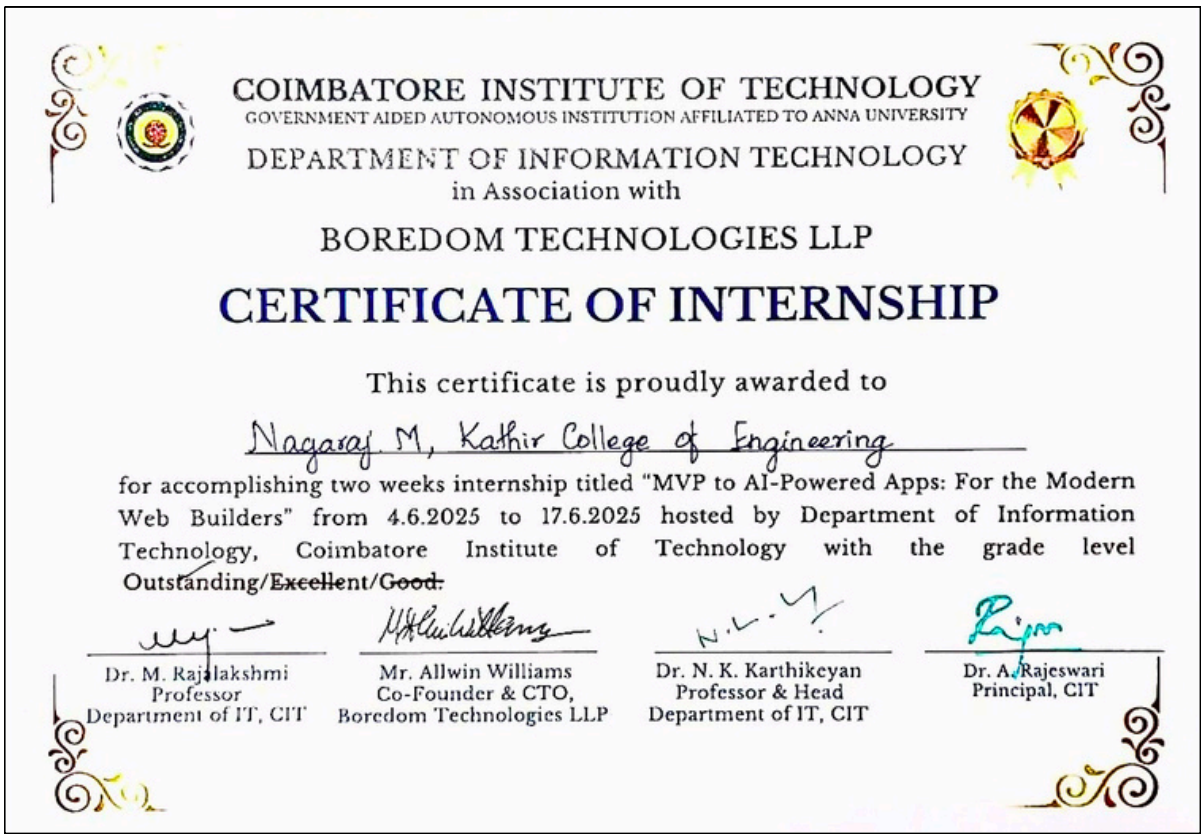
REFERENCES:

- **Next.js Documentation** – https://nextjs.org/docs
- **Firebase Documentation** – https://firebase.google.com/docs
- **Vercel Deployment Guide** – https://vercel.com/docs
- **OpenAI API Docs** – https://platform.openai.com/docs
- **React Documentation** – https://reactjs.org/docs/getting-started.html
- GitHub – https://github.com/nagaraj2331P/ecoai-trackers
- Tailwind CSS – https://tailwindcss.com/docs
- Google Fonts – https://fonts.google.com
- Mozilla Developer Network (MDN) – https://developer.mozilla.org

CONCLUSION:

The **EcoAI Sustainability Tracker** project successfully integrates cutting-edge web technologies with AI capabilities to offer an engaging user experience. By combining **Next.js**, **Firebase**, and the **OpenAI API**, we built a dynamic platform that provides eco-friendly suggestions based on user queries. Key features include a responsive interface, real-time AI responses, cloud storage integration, and analytics tracking via Vercel and Firebase. This project deepened our understanding of full-stack development, API integration, and user-centric design, paving the way for scalable and sustainable web applications.

COMPLETED CERTIFICATE :



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CERTIFICATE OF INTERNSHIP

This certificate is proudly awarded to

Nagaraj. M, Kathir College of Engineering

for accomplishing two weeks internship titled "MVP to AI-Powered Apps: For the Modern Web Builders" from 4.6.2025 to 17.6.2025 hosted by Department of Information Technology, Coimbatore Institute of Technology with the grade level Outstanding/~~Excellent~~/~~Good.~~

Dr. M. Rajalakshmi	Mr. Allwin Williams	Dr. N. K. Karthikeyan	Dr. A. Rajeswari
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