🌍 Sustainability Tracker – Day 6 Report

Tagline: *Helping you measure, reduce, and act for a greener future.*
Date: Day 6 of the AI App Challenge

Project: Sustainability Tracker – Day 5 Enhancements

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Objectives for Day 6

Final enhancements, debugging, and security hardening of the LLM/API integration to ensure a smooth, secure, and efficient user experience.

🔹 1. Prompt Optimization

- Reviewed all prompts used in generating eco-tips and summaries.
- Tested multiple prompt structures (short, directive, contextualized) for clarity and relevance.
- Added disambiguation handling (e.g., when user asks *"What can I do today?"* → returns practical daily eco-actions).
- Ensured tips remain **actionable, simple, and sustainable**, avoiding jargon.

Example:

- Input: "help" → Response: " 🌱 Try switching off unused appliances today to save energy."
- Input: "What's my tip?" → Response: " 🚶 Walk or cycle for short trips instead of driving."

🔹 2. Handling Edge Cases

- Tested incomplete/noisy inputs (empty fields, nonsense, emojis, etc.).
- Implemented fallback responses: default eco-tip or clarification request.
- Documented how the app responds under failure conditions.
- Logged edge-case test cases for reproducibility.

Examples:

- Input: " 😂 😂 😂 " → Response: " 🌎 Every smile is good energy! But here's a real eco-tip: switch to reusable water bottles."
- Input: [empty] → Response: " 💡 Try reducing standby power by unplugging idle devices."

🔹 **3. Performance Tuning**

- Measured average response time for generating eco-tips (<2s in most cases).
- Added caching for repeated or common eco-queries to reduce API load.
- Optimized token usage by trimming unnecessary prompt text.
- Verified rate limits: tested multiple requests/minute and ensured quota not exceeded.

🔹 **4. Error Handling & Debugging**

- Added user-friendly error messages:
  " ⚠️ Unable to generate a tip right now. Please try again later."
- Debugged formatting errors (e.g., long tips, broken newlines).
- Tested limits: very long inputs, multiple rapid requests, malformed queries.
- Verified **Last Tip persistence** when switching tabs or refreshing session.

🔹 **5. Final UX Enhancements**

- Added loading indicators during eco-tip/summary generation.
- Verified **copy/export buttons** (Streamlit built-ins) for text sharing.
- Improved layout: compact density, logical sections (Tips | Reports | History).
- Successfully tested **PDF/CSV export** → confirmed files download correctly.

🔹 **6. Security & Trustworthiness**

Risks Identified:

- Prompt injection
- Sensitive data leakage
- Tool misuse (if external integrations added later)

Mitigations Applied:

- LLMGuard / PromptShield → sanitize user inputs before API call.
- Guardrails AI → enforce structured outputs (eco-tips always follow 🌱 format).
- Rate-limit monitoring to reduce abuse risks.
- Documentation of all safeguards for transparency.

🔹 **7. Repository & Deliverables**

- ✅ All new code changes pushed to GitHub under Day 6 branch.
- ✅ Added Day 6 Report (this document, available as PDF/DOCX).
- ✅ Testing log with example inputs/outputs included.
- ✅ Bugs fixed documented (e.g., newline formatting, tip persistence).
- ✅ Security measures documented in SECURITY.md.
- ✅ Short demo video recorded showing:
    - Prompt improvements
    - Error handling
    - Export features
- ✅ GitHub email shared for Decoding Data Science organization access.

📌 **Summary**

Day 6 focused on **polishing the Sustainability Tracker into a reliable, secure, and user-friendly tool**. With optimized prompts, robust error handling, improved UX, and strong safeguards against misuse, the app is now stable and competition-ready.