One-Page Memo

What did we build?
Our team—Darien, Gabriel, and Zen—built QuakeGuard, a disaster simulation and response tool with a unique interactive map and AI-powered chatbot. The dashboard allows users to simulate disasters like earthquakes, floods, or hurricanes by setting parameters such as magnitude and impact radius. The AI assistant, located at the bottom of the dashboard, adds another layer of functionality by answering user-specific questions, such as “I’m located at…where is the closest shelter?” or “What should I do in an earthquake?”

Why is it cool?
QuakeGuard is both interactive and practical. It goes beyond static maps by letting users drop a location marker, adjust disaster scenarios, and visualize the affected areas. The chatbot integration sets it apart, enabling users to ask personalized questions and receive tailored responses in real-time. This combination of simulation, location-based functionality, and AI assistance makes it a practical tool for both education and real-world disaster response. It’s not just a simulation; it’s a proactive guide for preparedness.

What did we learn?
We learned how to integrate interactive maps using Leaflet.js and how to incorporate geolocation data effectively, including fallback IP-based methods. The chatbot required creative problem-solving to ensure it could handle location-based queries and real-time responses seamlessly. Additionally, we gained experience with responsive design using Tailwind CSS and balancing functionality across multiple user needs—simulation tools for planning and a chatbot for instant assistance. Collaboratively, we sharpened our team communication and problem-solving as we worked through design and coding challenges.

What comes next?
We plan to enhance the chatbot’s functionality to handle a wider range of emergency-related queries, such as providing detailed evacuation routes, live alerts, and resource locations during real disasters. Integrating real-time disaster feeds, such as earthquake and weather alerts, will make QuakeGuard more dynamic and responsive. Additionally, we aim to improve the accuracy of population impact estimates by connecting the tool to detailed regional databases and integrating a free API to retrieve population data for specific areas, ensuring users understand the true scale of potential impacts. Finally, we envision launching a mobile-friendly version, making QuakeGuard easily accessible anytime, anywhere.