

AmCham Bulgaria Hackathon 2026

Unified Smart City IoT Ecosystem

By A1 Bulgaria

March 20 – April 30, 2026



Unified Smart City IoT Ecosystem

Modern cities often manage critical resources - such as water, electricity, and waste - in "silos." Without a unified data layer, municipal authorities are often reactive rather than proactive.

This leads to massive resource waste through undetected water leaks, inefficient energy distribution, and maintenance crews being dispatched only after a failure has already occurred. Furthermore, citizens remain disconnected from their own consumption habits, lacking the tools to contribute to a sustainable urban environment.



ASSIGNMENT CONTENT

Develop an integrated End-to-End Smart City Prototype that connects urban hardware to human decision-making.

Your solution should bridge the gap between "dumb" infrastructure and "intelligent" management through three core pillars





MENTOR:

Martin Manchev - Senior Application Engineer



TECHNICAL REQUIREMENTS:

- **Smart Utility Monitoring (The Data Layer):**
 - Design a centralized dashboard that ingests real-time data from city-wide water meters or energy grids. The system must be capable of identifying anomalies - such as a 2 AM water surge (leak) or a sudden energy spike - to prevent resource waste.
- **Predictive Urban Maintenance (The AI Layer):**
 - Implement an AI-driven logic to transition from "fix-when-broken" to "predict-and-prevent." Use usage patterns to forecast when a streetlamp will fail or when a waste container will reach capacity, generating automated work orders for maintenance crews.
- **User-Centric "Citizen Portal" (The Engagement Layer):**
 - Build a mobile-friendly interface where residents can track their own consumption. Include an AI-driven "Eco-Coach" that provides personalized tips on how to save money and resources based on their specific usage data.

SKILLS TO BE DEVELOPED

- **Systems Thinking:** Learning to treat a city as an interconnected "web," understanding how data from one sector (like water pressure) impacts another (like road maintenance).
- **Data-Driven Decision Making:** Developing the ability to filter "noise" from thousands of IoT sensors to identify critical "signals," such as a hidden pipe burst or an energy surge.
- **User Experience (UX) Strategy:** Designing simple, engaging interfaces that motivate citizens to change their behavior and reduce their environmental footprint.
- **Technical Storytelling:** Mastering the "pitch" - the ability to explain a complex IoT architecture to a non-technical panel in a clear, persuasive, and visionary way.
- **Full-Stack IoT Development:** Gaining hands-on experience in "bridging" the gap between raw data (Python/SQL) and a functional user interface (React/Node.js).