Kareem Elsabrouty

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Personal statement

I build systems that connect hardware, databases, and user interfaces, often delivering solutions end-to-end. At Coinadrink, I joined as a new hire and rebuilt the company frontend, developed a contactless payment platform in Rust/React/Python that runs unattended on Raspberry Pi devices, implemented a C++/Arduino weight-tracking system for smart fridges, and created business intelligence dashboards that replaced static reports with live operational data.

I focus on choosing the right tools for the problem and have shipped production systems in Rust, PHP, and TypeScript within the same year. I learn by building and aim to build systems that last through clean architecture, automated updates, failure recovery, and attention to performance when resources are constrained. I enjoy working on ambiguous problems and turning them into reliable, working systems.

Education & Qualifications

- **BSc in Computer Science (1st)** - Staffordshire University (2024 - 2025)
- **Diploma in Computing (Merit)** - Walsall College (2021 - 2024)
- **Bootcamp Certificate** - Just It Software Development Bootcamp (2025)

Technologies & Libraries

Primary: JavaScript, TypeScript, React, Rust, Next.js, PHP, SQL, Python

Also experienced with: C/C++, Arduino, Tauri, React Native, Linux systems

Currently shipping production systems in TypeScript and Rust. Linux is my preferred development environment. Actively improving my Rust proficiency.

Key Projects

- **POS System –** Repo (Rust, TypeScript, Raspberry Pi, SQLite, Python)
  Architected and built a complete touchscreen payment system for PicoVend EZ Bridge vending machines deployed across multiple locations. The stack combines a React frontend with a Tauri/Rust desktop bridge, Python Flask backend for payment orchestration, and an Axum/Rust product editor server. Integrates directly with hardware via MDB serial protocol to handle contactless card payments, automated

dispensing, and real-time transaction state management. Features include automated OTA update distribution, remote product management via LAN-accessible admin panel, basket-based multi-item purchasing, and persistent order tracking across SQLite databases for managers to monitor. Designed for unattended operation and efficiency with automated failure recovery and a 70mb overall RAM footprint.

- **Cartesian Weight & Coordinating System –** Repo (C++, Arduino, React Native)
  Developed a smart weighing system using an Arduino and HX711 load cell amplifier. Enabled real-time weight and positional tracking for integration with a React Native smart fridge application via USB serial communication. The system charges users based on the weight and position of products removed in real time. This was a work project where I applied my C/C++ knowledge. *(Repository is a demo version; full implementation belonging to Coinadrink is private.)*

- **Editor Lite –** Repo (Rust, TypeScript, Tauri)
  Built with Rust, React and Tauri as a lightweight, simple editor designed to replace VS Code for day-to-day editing. Created to run on a potato (it uses around 3.3 MB RAM idle). The app prioritises a very clean, focused UI and keyboard-first interactions like opening files, terminal toggles, navigation and most actions to speed up work and improve developer efficiency. End-to-end built and optimised by me with a small, modular codebase focused on performance and ergonomics. Available for download on Windows.

- **Basic Web App –** Repo (Rust, Axum, Tokio, TypeScript, Docker)
  Built a production-ready auction platform with a Rust/Axum backend and React frontend, deployed on Render and Vercel. Implemented real-time bidding, session-based authentication, admin controls, and automated auction lifecycle management. Designed with clean architecture principles: RESTful API design, CRUD operations, database normalisation across five relational tables, and containerised deployment via Docker. Features include bid history tracking, auction scheduling, winner determination, and role-based access control separating user and admin systems. Payment provider integration ready for production deployment. (Project mainly for learning)

- **Jarvis Jr –** Repo (Python, JavaScript, Ollama)
  Local frontend UI communicating with a backend API to interact with a locally hosted LLM. Built with React on the frontend, Ollama for the LLM, and FastAPI for the backend. Features include chat history persistence via local storage, Redux state management, and real-time streamed responses. The project explored running a personal LLM at home and identified hardware limitations.

- **C Backend –** Repo (C, SQLite, JavaScript, HTML/CSS)
  Built a backend HTTP server in C from scratch to learn how servers, memory management, and databases work at a low level. Implemented request handling, JSON responses, SQLite database integration, and frontend connectivity.

- **StoriVault –** Repo (JavaScript, Redux, MongoDB, JWT, Express)
  Full-stack web app built collaboratively. Users create and manage serialized stories with chapters, review others' work, and authenticate via JWT and cookie-based sessions. Features dynamic search, reviews, and user profiles. Built as a team project focused on collaborative Git workflows.

More projects on GitHub (Starred Repositories)

Work Experience

- **Coinadrink ltd Junior Software Developer** (08/2025 – 05/2026)
  Rebuilt the entire company frontend in React (TSX) with Mantine UI library per specification, implementing authentication systems, session management, and a reusable component library with core abstractions. Handled complex navigation between legacy PHP and new React systems during phased migration. Managed PHP backend integration, API design, database management (MySQL, DB2, SQLite), and cross-system data synchronisation. Led the complete modernisation of legacy internal systems while building multiple new systems from scratch single-handedly with minimal oversight including business intelligence dashboards with interactive charts, data visualization, and business logic for operations analytics.
  Key Systems Delivered includes:
  - **Cartesian Weight & Coordinating System –** C++/Arduino smart weighing system with HX711 load cell amplifier; real-time weight/positional tracking via USB serial; integrated with React Native mobile app for smart fridge charging based on product removal
  - **Contactless POS System –** Full-stack vending machine payment platform (React, Tauri/Rust, Python Flask, SQLite); MDB serial protocol integration with PicoVend hardware; automated OTA updates.
  - **Customer Service Management System –** Task assignment and customer tracking platform with Teams integration; automated alerts to Teams channels; image storage; calendar sync for upcoming tasks; live status updates.
  - **Food Routes Scheduling System –** Drag-and-drop route planner using Google Matrix API for optimal delivery pathfinding; visual scheduling interface.

- **RAC Incident Manager** (03/2025 – 05/2025)
  Coordinated roadside incident responses, ensuring fast, safe support.
- **Asda Team Member** (10/2024 – 01/2025)
  Packed 1400+ orders per shift with 99% accuracy.
- **Lidl Warehouse Data Entry** (09/2022 – 01/2023)
  Maintained 98%+ accuracy updating stock databases.
- **Vodafone Call Centre Agent** (01/2019 – 09/2020)

Resolved 90% of complaints on first call; improved satisfaction.