

# Ahmed Ikram | Software Engineering

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## PROFILE

3rd-year Computer Science student at the University of Dundee on track for a First Class degree, seeking a software engineering placement or internship. Experienced in leading Agile teams and building production-ready systems across the entire stack - from responsive React/React Native frontends through to secure REST APIs, real-time WebSocket layers, and cloud infrastructure on AWS. Strong focus on system design, scalability, and delivering reliable, tested software end-to-end using GitHub Actions.

## EDUCATION

### High School of Dundee

Aug 2017 - June 2023

- National 5 Computer Science, Maths, English, Economics, Physics, Chemistry, Biology (A)
- Higher Computer Science, Maths and English (A), Higher Chemistry (B) and Higher Physics (C)
- Advanced Higher Computer Science (C)

### University of Dundee - BSc (Hons) Computer Science (Data Science and AI)

Sep 2023 - Present

- Expected Graduation: June 2027 (with year-long placement, June 2028)

## PROJECTS

### ATM Log Aggregation, Analysis & Diagnostics Platform | Python, FastAPI, SQLite, APScheduler, React, Vite

- Served as backend engineering lead on a 7-person Agile team delivering a production system for NCR Atleos
- Architected REST API across 4 routers with JWT authentication and RBAC, built an ingestion pipeline with 7 custom parsers, dead-letter routing for schema drift, and a retry-with-backoff mechanism for concurrent writes
- Engineered 48 automated tests across 5 tiers, integrated into CI/CD pipelines with GitHub Actions
- Extended the platform with a fully local RAG-based diagnostic assistant (LangChain, ChromaDB, Ollama) enabling natural language querying of ATM log history - architected as air-gapped so no log data leaves the local network, aligned with banking-grade data privacy requirements
- Worked from a formal requirements specification - translating 12 functional and 8 non-functional requirements and user stories with acceptance criteria into technical design decisions covering concurrency, data retention policy, RBAC scope, and schema contract; 48 automated tests mapped directly to formal acceptance criteria ensuring full requirements traceability

### DevSync Project Tracker with GitHub Integration | React, Flask, Socket.io, GitHub API, Pytest, AWS, Docker

- Built the full-stack end-to-end: React frontend with real-time WebSocket state synchronisation, Flask/SQLAlchemy REST API over a highly indexed PostgreSQL schema on AWS RDS, and a complete GitHub OAuth 2.0 flow allowing users to bi-directionally link platform tasks to live GitHub Issues and PRs
- Production-like AWS infrastructure: ECS Fargate behind an Application Load Balancer in a custom VPC; RDS PostgreSQL isolated in a private subnet with security group least-privilege access (only ECS can reach the RDS, only the ALB can reach ECS); frontend served via S3 + CloudFront with end-to-end HTTPS via ACM
- Implemented CI/CD via GitHub Actions (271 Pytest at 80% line coverage, 270 Jest at 90% line coverage, 5 Cypress E2E suites) with OIDC federation - no static AWS credentials stored; pipeline waits for ECS health checks to pass before going green, aborting if the service fails to stabilise

### StockLens FinTech Spending & Investment App | React Native Expo, TypeScript, Firebase, Node.js, Jest

- Built a full-stack mobile app in React Native/TypeScript with secure biometric authentication, real-time Firebase synchronisation, and custom AES encryption for sensitive data at rest
- Integrated a Node.js OCR pipeline parsing physical receipts into structured JSON records, querying the Alpha Vantage API to map spending to stock tickers and compute historical CAGR - covered by 78 Jest tests across OCR fallbacks, API caching, cryptography roundtrips, auth flows and more
- Engineered an ML layer combining ARIMA-based time-series forecasting for per-category spending trends and Linear Regression for forward-looking portfolio projections, fed by historical CAGR computed from Alpha Vantage data - surfaced directly in the app UI

### Rental Car Management System | C++

- Designed an OOP system with a polymorphic vehicle hierarchy, a generic repository template pattern, and smart pointer memory management - zero raw pointer usage throughout
- Implemented Levenshtein distance fuzzy search for vehicle and customer lookup, automated late fee and loyalty rewards logic, and an 8-scenario E2E test suite with file-based persistence

## PROJECTS

### Unix Version Control System | Bash

- Built a Git-like VCS from scratch in pure Bash; contains file tracking, check-in/check-out with file locking, timestamped backup versioning, automatic diff generation on every check-in, and filterable activity logging with user attribution - zero external dependencies beyond native Unix utilities
- Currently implementing branching and three-way merge support, an improved diff algorithm, and benchmarking performance against Git on representative workloads

## TECHNICAL SKILLS

<b>Languages</b>	Python, TypeScript, JavaScript, SQL, Bash
<b>Frontend</b>	React, React Native, HTML, CSS, Tailwind, Bootstrap
<b>Backend</b>	FastAPI, Flask, Node.js, REST APIs, WebSockets
<b>Databases</b>	PostgreSQL, SQLite, MySQL, MongoDB, NoSQL
<b>Cloud &amp; DevOps</b>	AWS (EC2, S3, RDS, IAM, SageMaker), Docker, GitHub Actions, Linux, Git, Azure
<b>Testing</b>	Pytest, Jest, React Native Testing Library, Cypress

## CERTIFICATES

<u>AWS Academy Graduate - Machine Learning Foundations</u>	<i>Feb 2025</i>
<u>AWS Academy Graduate - Cloud Foundations</u>	<i>Mar 2024</i>
<u>Foundations of Azure AI: Concepts, Capabilities, and Implementation</u>	<i>Oct 2024</i>

## EXPERIENCE

### **Beaully Mini Market, Dundee, Scotland**

*Retail Assistant*

*September 2023 - Present*

- Troubleshooted and resolved Point-of-Sale and stock system errors quickly to minimise customer wait time

### **Zulus Peri Peri Grill, Dundee, Scotland**

*Front of House Worker*

*June 2021 - September 2023*

- Trained 5 new staff members, helping them get up to speed quickly during busy service periods

## TRANSFERRABLE SKILLS

### **Agile & Iterative Delivery**

Comfortable owning work end-to-end within sprint cycles - scoping, building, testing, and shipping incrementally while adapting to changing requirements

### **System Design & Scalability**

Approach problems by reasoning about scalability, security, and maintainability from the start - not retrofitted after the fact

### **End-to-End Ownership**

Take full responsibility for delivery From requirements and user stories through schema design, API documentation, and architecture decisions through to cloud deployment and post-release monitoring against formal acceptance criteria

### **Cross-functional Collaboration**

Worked effectively across frontend, backend, and data engineering disciplines in team projects; comfortable coordinating with product managers and analysts

### **Test-Driven Development & Code Quality**

Enforce quality gates via automated test suites (Pytest, Jest, Cypress) at 80–90% line coverage; treat test coverage as a non-negotiable, not an afterthought

### **Debugging & Root Cause Analysis**

Systematic approach to isolating bugs; experienced diagnosing concurrency issues, privilege escalation vulnerabilities, and infrastructure failures under time pressure

### **Technical Communication**

Explain API behaviour, architecture trade-offs, and system design decisions clearly to both technical peers and non-technical stakeholders

### **Handling Ambiguity**

Adept at breaking loosely defined problems into concrete technical tasks with clear acceptance criteria and measurable outcomes