

Akashdeep Singh – Backend Engineering Project Portfolio

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1. AI-Powered Budget Advisor (Backend Architecture & Deployment)

Ongoing

Objective: Develop a secure and scalable backend for real-time financial tracking and advice.

Technologies: Python, Flask, Plaid API, AWS EC2, AWS RDS (MySQL), Docker, Kubernetes, GitHub Actions (CI/CD).

Key Contributions:

- Designed backend microservices for transaction categorization and analysis.
- Containerized services using Docker and orchestrated them via Kubernetes for scalability and fault tolerance.
- Implemented AWS RDS for relational data storage with optimized queries.
- Built CI/CD pipelines with GitHub Actions for automated testing, builds, and deployments.

Outcome: Achieved a scalable, cloud-native backend architecture capable of handling secure, high-volume API requests.

2. iOS Messaging App Backend (Cloud Integration)

2024

Objective: Provide real-time, scalable messaging backend for cross-platform Flutter app.

Technologies: Firebase, AWS S3, Python, Docker.

Key Contributions:

- Integrated AWS S3 for media file storage with secure access control.
- Designed real-time messaging backend leveraging Firebase's sync features.
- Performed load testing and containerized backend components for portability.

Outcome: Delivered a backend capable of supporting high-user concurrency while maintaining low latency.

3. Distributed Algorithm Testing Environment (Floyd-Warshall)

2024

Objective: Implement and benchmark Floyd-Warshall algorithm in distributed testing environments.

Technologies: Python, Docker, Bash scripting.

Key Contributions:

- Developed shortest-path algorithm implementation optimized for large graph datasets.
- Created containerized test environments with Docker for reproducible benchmarks.
- Automated multiple test runs with shell scripts to evaluate performance.

Outcome: Produced performance benchmarks demonstrating efficiency gains on large datasets.

Note: Additional projects and source code are available on GitHub:
github.com/imakashrandhawa