AYUSH RAKESH

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Education

Indian Institute of Information Technology and Management, Gwalior　　　　**2021 - 2026**
Integrated Bachelors and Masters of Technology (B.Tech + M.Tech)　　　　*7.61/10 CGPA*

Work Experience

Feesbook Technologies　　　　**Oct 2023 – Dec 2023**
Software Development Intern　　　　*Remote*

- Contributed in several key features for a student coaching mobile application using Flutter, implementing intuitive functionalities that significantly enhanced user engagement and streamlined learning experiences.
- Integrated 5+ RESTful APIs and third-party libraries, enhancing app interactivity.
- Engineered responsive and optimized UI/UX designs, ensuring seamless cross-platform performance and consistent user experiences across iOS and Android devices.

Projects

Allocyte: Custom Linux Memory Manager　　　　**Source Code**

- Developed a custom heap memory manager in C++ for Linux, implementing allocation and deallocation APIs (**mmap, xfree**) to efficiently manage process memory across **virtual memory pages**, minimizing **fragmentation**.
- Built thread-safe memory pools leveraging a **custom gluethread library** with robust **doubly linked lists**, significantly optimizing performance by minimizing system calls and context switching in complex multi-threaded environments.
- Seamlessly integrated **slab allocation** and **free-list management** using metadata-driven doubly linked lists, effectively mitigating internal and external fragmentation to maximize memory utilization across diverse application structures.
- Enabled detailed memory usage statistics and debugging tools, tracking per-structure block counts and consumption to **support memory leak analysis**, validated through test applications compiled with GCC.

ShipShop: A Database solution　　　　**Source Code**

- Designed and developed fully a **MySQL** database for an e-commerce platform from scratch, modeling entities such as, sessions, products, orders, and refunds, and implemented foreign key constraints to ensure data integrity across tables.
- Implemented advanced SQL logic including a **trigger** (insert_orders) to auto-populate aggregated order summaries after order_items inserts, and a **procedure** (order_performance) to report revenue and order counts over custom date ranges.
- Built analytical **views** (monthly_orders, monthly_sessions, monthly_website_sessions) to calculate revenue and monitor traffic segmented by marketing source and campaign, supporting performance tracking and business decision making.
- Optimized SQL query performance through strategic **indexing** on order_items(product_id) and order_items(created_at), reducing full table scans and cutting scan cost from **1607** to **186** rows, as validated via **EXPLAIN ANALYZE**.

Visinetra: Network Visibility & Telemetry Automation　　　　**Source Code**

- Designed **Ansible** playbooks to automate a client-server network in **GNS3**, deploying Nginx, firewall rules, and static routing on Linux containers, configuring IP forwarding and **NAT** for internet access, showcasing automation expertise.
- Deployed a monitoring stack using **Telegraf** to collect system and **SNMP** metrics from Linux hosts, storing them in **InfluxDB** for real-time **Grafana** visualization, showcasing expertise in observability and network instrumentation.
- Created a custom traffic generation script on Client1 to simulate **HTTP** requests to Server1, enabling performance analysis under load with **Grafana** monitoring, demonstrating strong network testing and system administration skills.

Technical Skills

Languages: C++, Dart
Frameworks: Flutter, Firebase, Ansible
Clouds & Databases: PostgreSQL, Google Cloud, Firebase Firestore, Amazon Web Services, InfluxDB
DevOps & Monitoring: Docker, Kubernetes, Grafana, Telegraf, SNMP
Developer Tools: Postman, VS Code, GitHub, GNS3
Course Work: Data Structures and Algorithms, CN, OOPS, OS, DBMS, Network Security

Algorithmic Competitions/Achievements

- Solved 500+ problems across platforms such as **LeetCode** and **GFG**, demonstrating strong problem-solving skills.
- **Ranked 4th** globally among **2,000+** teams in Hacksquad 2023, a competitive open-source contribution event, demonstrating strong collaboration, and impactful project contributions.