Prakhar Agarwal

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PROFESSIONAL EXPERIENCE

Software Development Engineer II, Tally Solutions Pvt Ltd, Bengaluru, India   **Apr 2023 - Present**
Project Name: Tally Network Server (TNS)
Tech Stack: C++, Windows API, DLLs, Multithreading, HTTP, Load Testing

- Optimized multithreaded HTTP server's request handling, reducing memory consumption by >90% for concurrent requests.
- Developed modular Content Delivery Service (CDS) DLL and decoupled it from Tally Net Server, enabling flexible integration with multiple server types
- Improved CDS startup performance by 70% through DLL load time optimization and memory management enhancements
- Conducted load testing and performance optimization for high-concurrency scenarios (10,000+ simultaneous requests)
- Redesigned response handling architecture to eliminate redundant data copying, significantly improving memory efficiency for large file transfers
- Architected a high-performance multithreaded HTTP server using Windows IOCP and asynchronous networking APIs, with a custom thread pool designed to efficiently handle millions of concurrent requests.
- Added support for memory-mapped file responses, keep-alive connections, and clean shutdown with Windows service fallback.

Software Development Engineer I, Tally Solutions Pvt Ltd, Bengaluru, India   **Sep 2022 - Mar 2023**
Project Name: Lightweight Synchronization Lock (SyncFlag)
Tech Stack: C++, x86/x64 Inline Assembly, Windows Threading, Custom Locks

- Designed and implemented a custom synchronization primitive supporting both exclusive (write) and shared (read) locking using 32-bit and 64-bit atomic instructions.
- Built for low-overhead synchronization in highly concurrent environments, avoiding kernel-level mutexes.
- Developed separate implementations for 32-bit and 64-bit platforms using inline assembly (LOCK CMPXCHG, etc.) for precise control.
- Developed advanced concurrency control mechanisms using Sync Lock and Threading technologies, creating a secure and reliable authentication system that handles multiple simultaneous users
- Used to solve the Readers-Writers Problem, ensuring safe concurrent access without starvation or deadlock
- Integrated and tested the lock with a thread queue system under stress to validate correctness and performance

Trainee Software Development Engineer, Pepcoding Education Private Limited, Noida, India   **Aug 2021 - Nov 2021**
Project Name: Nados , Noida, India
Tech Stack: Javascript, Typescript, Kafka, NodeJs

- Architected and delivered a scalable microservices platform handling 200+ concurrent code executions per hour with 99.5% uptime
- Engineered a Problem Admin Service managing a repository of 200+ coding problems, reducing problem creation and update time by 25% through optimized CRUD operations
- Developed a robust Executor Service supporting 3 programming languages (Java, Python, C++), achieving 40% faster execution time through strategic implementation of design patterns
- Built a high-performance submission service processing 2,000+ daily submissions with an average response time of <5 seconds using Fastify and Redis queue optimization
- Led the migration from Redis to Kafka for asynchronous processing, resulting in 35% reduction in response time and 20% improvement in system throughput
- Improved system reliability by implementing advanced concurrency controls, reducing system failures by 45% and achieving minimal downtime during peak loads of 100+ simultaneous users

EDUCATION

Bangalore Institute of Technology, Bengaluru, India - *Bachelor of Engineering, Computer Science and Engineering - GPA: 8.2*   **Jan 2018 - Dec 2022**

SKILLS

Programming Languages	: C, C++, JAVA
Development Tools	: Visual Studio, Postman, Git, Jira, Wiki, BitBucket, Jmeter
Database Technologies	: MySQL, MongoDB
Core Concepts	: Data Structures, Algorithms, Object Oriented Programming, Concurrency, DBMS