Tiruvaipati Sree Ranga Lakshmi Sai Jaipreeth

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</> LeetCode — </> Codeforces — </> AlgoZenith

Education

Indian Institute of Information Technology and Management Gwalior, India
B.Tech in Mathematics and Scientific Computing *Aug 2023 – Jun 2027*
- **CGPA: 9.43 / 10.0** (Rank 1, Batch Topper); Semester 3 GPA: **10.0 / 10.0**

Technical Skills

Languages: C++ (STL), Go (Golang), Python, SQL, C
Systems & Backend: Multi-threading, Concurrency (Goroutines), Socket Programming, Database Internals (B-Trees, ACID), Memory Management
Machine Learning & AI: Computer Vision (OpenCV), Time Series Forecasting (ARIMA, LSTM, Transformers), Fuzzy Logic, XGBoost
Libraries & Tools: Pandas, NumPy, Scikit-learn, Git/GitHub
Coursework: Data Structures And Algorithms , Operating System , Computer Network , Database Management System, OOPS

Experience

Undergraduate Researcher | *Guide: Dr. S. Jeevaraj, Dept. of Engineering Sciences, ABV-IIITM* **September 2025**
- Engineered a robust forecasting pipeline for 180k+ records, performing rigorous cleaning, structural break detection, and memory optimization (reducing usage by 53%).
- Benchmarked 15+ algorithms including Statistical (ARIMA), ML (XGBoost), and Deep Learning (LSTM, TCN, Transformers) to predict daily sales.
- Designed a novel Fuzzy Logic Ensemble system that dynamically selects optimal models based on volatility and trend analysis, enhancing prediction stability.
- Developed a comprehensive evaluation framework using 7+ metrics (MAE, RMSE, BAPE), visualizing model performance to minimize forecasting bias.

Projects

Rubik's Cube Solver using Korf's IDA* Algorithm | *C++, OpenCV, IDA*, Pattern Databases* **April 2025**
- Modeled the cube using **Bitboards** and OOP principles, optimizing state representation with custom hash functions to enable O(1) lookups in `unordered_map<>`.
- Implemented **Korf's IDA* Algorithm** with a **Corner Pattern Database**, reducing solution search space by 90% and solving 13-move scrambles in **less than 10 seconds**.
- Developed an **OpenCV pipeline** for real-time face detection and color classification, mapping physical cubes to 3D internal states for automated digital solving.

SQL Database Engine with B-Tree Indexing (SQLite Clone) | *C++, Binary File I/O, SQL Parser* **Feb 2025**
- Architected a storage engine that parses **SQLite binary format**, managing Page headers and varint decoding to extract table schemas and row data directly from disk.
- Engineered a **B-Tree indexing system** supporting full-table scans and index lookups with **O(log n)** complexity, reducing query latency by up to **80%**.
- Developed a **SQL parser and executor** supporting SELECT (WHERE, COUNT), multi-column projections, and table resolution by decoding the internal `sqlite_master` schema.

Multithreaded Redis Server (100+ Stage Implementation) | *Go, TCP, RESP, Concurrency* **December 2025**
- Engineered a multi-threaded server in **Go** using **Goroutines**, handling concurrent TCP connections via raw sockets and parsing commands with the **RESP protocol**.
- Implemented **40+ commands** across Strings, Lists, Streams, Sorted Sets, and **Pub/Sub**, supporting blocking operations (BLPOP) and auto-generated Stream IDs.
- Built **ACID-compliant transactions**, **Master-Replica Replication** (RDB persistence, handshake protocols), and **ACL authentication** for granular user access control.

Scholastic Achievements & Leadership

- Secured Global Rank **1,253** (Top 9%) in **Meta Hacker Cup 2025**, qualifying for Round 2.
- **Competitive Programming:** Practiced 600+ questions from different platforms (Leetcode, Codeforces and Algozeinth).
- Recipient of the **Merit-Cum-Means Scholarship** for consistent academic excellence (Batch Rank 1).
- **Founder, Team Echo:** Established the institute's official outreach body; scaled team to lead publicity campaigns.
- **Joint Secretary, Student Activity Council:** Spearheaded student welfare initiatives and managed cultural fest budgets.