

Jayant Tomar

jayanttomar596@gmail.com | LinkedIn | GitHub | Portfolio | LeetCode | CodeForces | CodeChef

Education

Delhi Technological University (Formerly Delhi College of Engineering) <i>Bachelor of Technology in Computer Science and Engineering</i>	CGPA: 9.34/10 2024 – 2028
Sidhhartha Public School, Delhi <i>CBSE (Class XII)</i>	95% 2023 – 2024
Vikalp Public School, Rohtak <i>CBSE (Class X)</i>	96.80% 2021 – 2022

Technical Skills

Languages: C++, Python, C, SQL, JavaScript, HTML, CSS

Technologies: FastAPI, Node.js, MySQL, STL, Ollama, LangChain, Vector Embeddings

Core CS: Operating Systems, Object-Oriented Programming, Database Management Systems, Computer Networks

Concepts: Multithreading, Concurrency, Information Retrieval, REST APIs, TCP/IP, WebSockets, Vector Search

Tools: Git, GitHub, Linux, Docker, Docker Compose, Makefile, Render, Vercel

Projects

Fast Hybrid Search Engine GitHub | Video

- Built a multithreaded C++ hybrid search engine combining BM25-based inverted-index retrieval with Ollama-generated vector embeddings, and integrated the retrieval pipeline with a FastAPI RAG gateway using LangChain.
- Implemented Trie-based autocomplete, Levenshtein-distance spell correction, thread-safe LRU query caching, cosine-similarity semantic caching, and Top-K heap-based result selection to optimize query processing.
- Developed a C++ HTTP backend exposing REST APIs for search, snippets, autocomplete, and benchmarking, with PDF document ingestion and CORS support.
- Engineered an incremental indexing pipeline with POSIX mmap-backed persistence and startup garbage collection, eliminating full index rebuilds on restart; containerized services using Docker and Docker Compose.
- Parallelized indexing using thread-local inverted indexes with post-merge aggregation, achieving a **2.14×** speedup with 8 threads on a **1,004**-document corpus; benchmarked the search endpoint at **0.76 ms** average latency and **1,319 QPS**.

High-Performance In-Memory Key-Value Store GitHub | Live Demo | Video

- Enabled thread-safe concurrent operations through mutex synchronization and tested **500 simultaneous TCP clients** at **0.305 ms** mean latency with sub-**0.9 ms** p99 latency.
- Designed hybrid persistence using a write-ahead log and periodic full-state snapshots, enabling crash recovery through snapshot restoration followed by WAL replay.
- Replaced full-scan TTL expiration with heap-based $O(\log n)$ expiry management, sustaining **55K TTL-enabled SET** operations/sec at **0.018 ms** average latency.
- Established asynchronous primary-replica replication with snapshot-based initial synchronization followed by real-time write-command propagation to connected replicas.
- Measured the C++ TCP server at **93K+ GET ops/sec** and **60K+ SET ops/sec** over localhost; containerized with Docker and deployed on Render; added a WebSocket-to-TCP proxy bridge for real-time client telemetry.

Achievements and Awards

- **Competitive Programming:** Knight (1885) on LeetCode, Pupil (1326) on Codeforces, and 3-Star on CodeChef.
- **Algorithmic Consistency:** Solved 1000+ DSA problems across various platforms, maintaining a 200-day streak.
- **HPAIR Asia Conference 2026:** Selected as a global delegate for the Harvard College Project for Asian and International Relations (HPAIR) Conference at VinUniversity in Hanoi, Vietnam. - Acceptance Letter
- **Top 12 Finalist:** Hack-LLM (24-Hour Hackathon), IIIT Delhi - Certificate
- **Goldman Sachs India Hackathon 2026 - CS:** Achieved All India Rank 1127 - Leaderboard
- **JEE Main & Advanced 2024:** Secured 99.27 percentile in JEE Main and AIR 10,987 in JEE Advanced.

Certifications

Algorithms Specialization (Stanford Online)
Machine Learning Specialization (Stanford Online)

Distributed Systems and Web Services (Coursera)
Dynamic Programming Camp (AlgoUniversity)