ISHJAAP SINGH

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Backend and systems developer with experience building compilers, database engines, concurrent search tooling, and graph query runtimes in Go and TypeScript. Comfortable working at the level of storage pages, execution pipelines, and REST APIs.

SKILLS

Languages Go · TypeScript · JavaScript · SQL

Systems Compilers · Database Internals · Concurrent Systems

Backend Node.js · PostgreSQL · REST APIs · WebSockets · Redis

Tools Git · Linux · Docker

PROJECTS

Sceptre — Embedded Database Engine · GitHub *Go*

- Built a single-file DB engine in Go: fixed-size pager, dual meta-page checksums, copy-on-write commits, and freelist-based page reuse.
- Implemented a B+ tree, typed table records, secondary indexes, and a query planner with EXPLAIN and TRACE; index cut rows scanned from 100,000 to 1,429 (70×), 16.8× faster.
- Validated crash recovery at page-write, fsync, and meta-publish boundaries using randomized interruption tests with reproducible seeds.

Orion — WebAssembly Compiler · GitHub *TypeScript*

- Compiler for a custom language (Astra) that emits raw WebAssembly binary — no WAT intermediate, no external toolchain.
- Hand-written lexer, recursive-descent parser, AST, and code generator with lexical scoping, structured control flow, and deterministic stack semantics.
- Validated end-to-end correctness by compiling and running a full Mandelbrot set renderer.

gosearch — Concurrent Code Search · GitHub *Go*

- Zero-dependency CLI search tool using a 4-stage pipeline: directory traversal, I/O workers, CPU search workers, and a streaming output printer.
- Dynamic worker scaling; benchmarked at 1.2 ms/op across 10,000 files.
- Regex and substring matching, .gitignore support, JSON output, and shell completions for bash, zsh, fish, and PowerShell.

Benz — Graph Query Engine · GitHub *TypeScript*

- Lazy graph query engine using pull-based (Volcano-style) iterator execution with explicit program counters and resumable traversal state.
- Index-free adjacency storage and Gremlin-style traversal pipelines.
- Step-level query plan inspection showing execution path and iterator states.

EXPERIENCE

Technical Secretary · Microsoft Learn Student Chapter, TIET *Jul 2025 – Present*

- Built and maintained backend tools and student-facing websites in Node.js; wrote unit tests, containerized services with Docker, and conducted code reviews.
- Designed and shipped a hackathon management platform for Makeathon 8 supporting 100+ teams. Mentored 10+ developers on tooling and open-source workflow.

EDUCATION

Thapar Institute of Engineering and Technology · B.E. Computer Engineering *2024 – 2028*

Coursework: Data Structures & Algorithms · Database Systems · Operating Systems · Computer Networks

Activities: MLSC Technical Secretary · Makeathon 8 Organiser