

SHIVAM

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Education

Bennett University

Bachelor of Technology in Computer Science and Engineering

Greater Noida, India

Aug. 2026 – Expected 2030

Indira Gandhi National Open University (IGNOU)

Bachelor of Science (Honours) in Mathematics; concurrent distance degree

New Delhi, India

Aug. 2026 – Expected 2030

Selected Projects

TrueCoder | *Python, Linux/POSIX, Docker, SQLite, cgroups* [GitHub](#)

July 2026 – Present

- Building a terminal-native coding agent with streaming LLM orchestration, persistent and switchable sessions, repository-aware instructions, structured file-editing tools, and resumable human approval boundaries.
- Designed a policy- and capability-driven execution service that selects between native POSIX and container sandboxes while enforcing workspace, environment, network, command, and resource restrictions.
- Implemented process-group cancellation and cleanup, cgroup CPU and memory limits, bounded output capture, secret filtering, structured error handling, and an immutable SQLite execution audit trail.

TrueMetaverse | *TypeScript, WebSockets, PostgreSQL, Redis, WebRTC* [GitHub](#) [Live](#)

July 2026

- Built and self-hosted a real-time 2D collaborative world with server-authoritative movement and collision, room-scoped chat, persistent study systems, synchronized whiteboards, presentations, and a 3–12 player Hide & Seek mode.
- Architected separate application and media planes spanning an HTTP control service, authoritative WebSocket server, PostgreSQL, Redis, LiveKit WebRTC, TURN fallback, and Nginx/Caddy gateways across seven long-running containers.
- Created 145 automated unit, regression, and integration scenarios covering authentication, rooms, movement, collision, games, rate limiting, connection lifecycle, media permissions, and graceful shutdown, with 88% line coverage across tested modules.

TrueFlashcard | *Go, gRPC/Connect, PostgreSQL, Next.js, React Native* [GitHub](#) [Live](#)

2026

- Developed a cross-platform spaced-repetition system with one Go backend, generated web and mobile clients, shared Protobuf contracts, and the same domain services exposed over native gRPC and browser-compatible Connect RPC.
- Implemented a dependency-free FSRS-style scheduler in under 200 lines of pure Go, modelling per-card stability, difficulty, retrievability, learning state, lapses, and retention-based review intervals.
- Made review submissions transactional across current card state and an append-only history, and built Google OAuth, typed SQL access, ownership enforcement, bulk deck import, CI checks, and automated backend deployment.

Mathematics & Problem Solving

Independent Mathematics | *Linear algebra, abstract algebra, and number theory* [FLT foundations](#)

2026 – Present

- Studying *Linear Algebra Done Right* independently through proof construction, reconstruction, and written exposition, emphasizing structural reasoning about vector spaces, linear maps, quotient spaces, and their analogies with groups and quotient groups.
- Produced a structured expository roadmap to Fermat's Last Theorem: worked through the classical $n = 3$ case and surveyed the dependency chain from abstract algebra and Galois theory to elliptic curves, modular forms, Hecke operators, and the modularity theorem.

Competitive Programming | *C++*

- Reached a peak Codeforces rating of 1400; implemented advanced range-query structures including lazy segment trees and segment tree beats, and use invariant- and proof-driven analysis across greedy, graph, and dynamic-programming problems.

Technical Skills

Languages: Python, TypeScript, Go, C++, SQL, Rust

Systems & Distributed Infrastructure: Linux/POSIX, processes and signals, cgroups, sandboxed execution, Docker/Compose, WebSockets, WebRTC, gRPC

Data & Platforms: PostgreSQL, Redis, SQLite, Nginx, Caddy L4, LiveKit, Prisma, Bun