

# Yashwant Singh Rana

Software Engineer in Systems and Generative AI

yashwantrana7310@gmail.com | +91 7983528260

[Portfolio](#) | [GitHub](#) | [LinkedIn](#) | [LeetCode](#)

Software engineer with experience in IBM Z C/C++ compiler development, MCP services, and retrieval applications using Python and FastAPI. Contributor to Qualcomm's LLVM-based ELD linker.

## Experience

### IBM ISL

Jul 2025 - Sep 2026

Software Engineer

Bengaluru, Karnataka

- Resolved **8+ production defects** in the IBM Z C/C++ compiler backend across code generation, register allocation, and compiler optimization.
- Implemented a **Model Context Protocol (MCP)** service for AI-assisted retrieval of **compiler diagnostics**.
- Debugged memory-management and multithreading failures with **GDB**, Linux utilities, and profiling tools.
- Automated development, build, and test workflows using shell scripts, Git, Linux, and CI/CD.

### IBM ISL

Jan 2025 - Jul 2025

Software Engineer Intern

Bengaluru, Karnataka

- Fixed C/C++ compiler frontend and backend bugs in parsing, **AST processing**, and code generation; added defensive checks and assertions.
- Built Zowe automation scripts and contributed frontend and backend features to an AI-assisted developer platform.

## Open Source Contributions

### Qualcomm ELD | C++ and LLVM

- Added GNU-compatible numeric **-0 handling** and fixed **PHDRS/FILEHDR crashes** in two merged PRs, with regression tests across **six target configurations**. [PR #2011](#), [PR #2065](#).
- Submitted ARM/AArch64 LTO object-emission and AArch64 GNU-property fixes with focused regression tests. Open PRs: [#2129](#), [#2134](#).

## Projects

### Legal Lens 2.0 | Python, FastAPI, Next.js

[GitHub](#)

- Built page-aware search over a **1,871-page historical IPC PDF**, combining **BM25 and MiniLM embeddings** with reciprocal rank fusion.
- Added **retrieval-augmented generation (RAG)** with page-linked citations and document-excerpt fallback when generation is unavailable.
- Implemented a local MiniLM/logistic-regression classifier for question scope and intent; added research-brief export.

### Real Estate Aggregator | PHP, Slim, MySQL, JavaScript

[GitHub](#)

- Built a property marketplace prototype with MySQL-backed listing filters, account workflows, **Razorpay integration**, and PDF contract generation.

## Technical Skills

**Languages:** C++, C, Python, Java, JavaScript, SQL

**Systems:** Compiler development, LLVM, Linux, GDB, CMake, shell scripting, multithreading

**AI and Retrieval:** MCP, LLMs, RAG, BM25, MiniLM, scikit-learn

**Backend and Tools:** FastAPI, Next.js, REST APIs, PostgreSQL, MySQL, Docker, Git, CI/CD

## Education

### Indraprastha Institute of Information Technology Delhi

Jul 2023 - Jun 2025

M.Tech in Computer Science and Engineering; CGPA: 8.37/10

Delhi

### Graphic Era Hill University

Aug 2019 - May 2023

B.Tech in Computer Science and Engineering; CGPA: 8.27/10

Uttarakhand

## Recognition and Leadership

- Received the **IBM Monthly Star Performer Award** for performance and contribution.
- Teaching Assistant for OOPD, DSA, Theory of Computation, and Operating Systems; led GEHU's **40+ member Cricket Club** as president.