Maanas Singh

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EDUCATION

BITS Pilani　　　　　　　　　　　　　　　　　　　　　　Pilani, Rajasthan
B.E. Electronics and Communications, M.Sc. Mathematics (Dual Degree)　　　　*2021 – 2026*

EXPERIENCE

Uber　　　　　　　　　　　　　　　　　　　　　　Bengaluru, Karnataka
Software Engineering Intern　　　　　　　　　　　　　*May 2025 – July 2025*
- Engineered a **LangGraph-based RAG assistant** in **Python** to answer compliance queries by generating and executing context-aware **SQL** over a custom **MySQL** database.
- Automated daily validation and ingestion of YAML configs into MySQL, with alerting to ensure data freshness for the RAG assistant.
- Developed a pipeline to detect merchant data changes from **Hive** and publish updates to **Kafka**, with a **Golang** consumer for downstream processing.

TrueFoundry　　　　　　　　　　　　　　　　　　　　　　Remote
Software Engineering Intern　　　　　　　　　　　　　*Oct 2024 – April 2025*
- Worked on the **Autopilot module** of TrueFoundry's **NestJS backend**, enabling dynamic scaling of **CPU/memory requests and limits** for Kubernetes workloads using various metrics.
- Contributed to **KubeElasti**, a **Go-based** open-source system for **scale-to-zero**, composed of a **Kubernetes operator** and a reverse proxy resolver.
- Implemented the **scale-to-zero logic from scratch**, designing an extensible scaler interface and building a **Prometheus-based scaler** to trigger scale-down based on metric thresholds and comparison operators.

GPlan　　　　　　　　　　　　　　　　　　　　　　Pilani, Rajasthan
Software Development Intern　　　　　　　　　　　　　*Aug 2023 – Aug 2024*
- Developed **backend infrastructure** and **REST APIs** for automated floorplan generation (**Django**, **PostgreSQL**), integrating core graph algorithms and Stripe payments; deployed robust, scalable systems with **Docker**, **Nginx**, and CI/CD pipelines.
- Built the web backend for the GPlan game using **Go** (**Gin**) and **PostgreSQL**, enabling real-time gameplay and seamless integration with existing services.

BITS Pilani　　　　　　　　　　　　　　　　　　　　　　Pilani, Rajasthan
Backend Developer & Teaching Assistant　　　　　*April 2023 – June 2023, May 2024 – Dec 2024*
- **Hostel Allocation Portal**: Architected and deployed the hostel allocation portal (**Express.js**, **Node.js**, **MongoDB**, **Kubernetes**) serving **3500+** students with **98.9%** accuracy and **zero-downtime**.
- **Teaching Assistant — Web Programming**: Mentored hundreds of students in web technologies: (**HTML, CSS, JS, PHP**)

PROJECTS

- **BITS Fest Backend Infrastructure**: Developed **REST APIs** and async wallet system (**Django**, **PostgreSQL**, **Docker**) processing **INR 2.5Cr+** for **5,000+** users (**1,600+** peak concurrent); ensured **99.9% uptime** with Dockerized, load-balanced deployment.
- **Minimal Relational Database in Go**: Built a **relational database from scratch** in **Go**, starting with a **B+tree** for efficient data querying and manipulation. Implemented **durability features**, a **copy-on-write KV store** supporting **concurrent transactions**, and a custom SQL-like query language.

COMPETITIONS

- **Candidate Master, Codeforces** (Rating: 1966, Rank: 156 in India)
- **ICPC Regionalist, Amritapuri 2024-25**

TECHNICAL SKILLS

Languages: Go, Python, JavaScript, Lua, C, C++, Java, SQL
Frameworks: Django, Django REST Framework, Node.js, Express.js, NestJS
DevOps: Docker, Kubernetes, Nginx, Gunicorn, Github Actions, Linux
Data: PostgreSQL, MongoDB, MySQL, SQLite, Hive, Kafka, LangGraph