

Kumaresan K

Python Backend Engineer · AI Systems · REST API Design

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PROFESSIONAL SUMMARY

Final-year Software Engineering student (CGPA 8.26) specialising in Python backend development and AI systems engineering. Proficient in building production-grade REST APIs with FastAPI and Flask, designing multi-agent LLM pipelines with LangChain and LangGraph, and implementing RAG systems with ChromaDB and HuggingFace embeddings. Demonstrated ability to ship clean, modular, independently testable Python systems. Targeting Python Backend / Software Engineer roles at product-focused companies.

TECHNICAL SKILLS

Languages	Python 3, SQL
Backend	FastAPI, Flask, SQLAlchemy ORM, SQLite, MySQL, REST API Design, OpenAPI / Swagger, python-dotenv, joblib
AI / ML	LangChain, LangGraph, RAG, ChromaDB, HuggingFace Embeddings, Scikit-Learn, TensorFlow, Pandas, NumPy, BG/NBD, Gamma-Gamma
Tools	Git, GitHub, pytest, Jupyter, VS Code, conda, Postman

PROJECTS

M.I.L.O — Modular Offline AI Assistant

Python · PyQt5 · SQLite · faster-whisper · AES-256 cryptography · pytest

- Architected a 10-package Python system (voice, NLP, GUI, database, automation, security) with strict interface boundaries — each module independently testable and swappable.
- Built a fully offline speech pipeline: faster-whisper STT → intent classifier → action dispatcher, achieving <400 ms round-trip latency with zero cloud dependency.
- Implemented a SQLite backend with FTS5 full-text search, AES-256 encrypted finance vault, and optional voice-biometric auth; validated with a comprehensive pytest suite.
- github.com/kuman002/M.I.L.O

Agentic AI Backend — Multi-Agent REST API Service

Python · FastAPI · LangGraph · LangChain · ChromaDB · SQLAlchemy ORM

- Architected a stateful LangGraph workflow routing queries to 4 specialised agents — weather, RAG doc-QA, meeting scheduler, and NL→SQL — decoupled from the LLM provider via config.
- Engineered a full RAG pipeline (PDF ingestion → chunking → HuggingFace embeddings → ChromaDB) with <300 ms p95 retrieval and graceful web-search fallback.
- Delivered clean FastAPI REST endpoints with auto-generated OpenAPI docs; 5 single-responsibility modules with SQLAlchemy ORM and .env secrets management.
- github.com/kuman002/agentic-backend

Academic Notes AI — Context-Bound RAG Q&A System

Python · Flask · LangChain · ChromaDB · HuggingFace · Llama-3 · Groq

- Built a RAG-powered Q&A service that answers student questions strictly from uploaded academic PDFs — returning source page attribution for every answer and explicit out-of-scope rejection for hallucination control.
- Pipeline: PDF ingestion → semantic chunking → all-MiniLM-L6-v2 local embeddings → ChromaDB persistent vector store → Llama-3.3-70B (Groq) with strict grounding prompt; served via Flask REST API (/upload, /ask).
- github.com/kuman002/academic-notes-ai

Bangalore House Price Prediction — ML Micro-Service

Python · Flask · Scikit-Learn · Linear Regression · joblib · REST API

- Shipped an end-to-end ML micro-service: EDA → feature engineering → Linear Regression ($R^2 = 0.80$) → joblib serialisation → Flask REST API with real-time inference, structured logging, and input validation.
- github.com/kuman002/Bangalore-House-Price-Prediction

Customer Lifetime Value — Probabilistic Revenue Modelling

Python · BG/NBD · Gamma-Gamma · Pandas · Seaborn · Matplotlib

- Quantified future revenue for ~3,000 customers using BG/NBD + Gamma-Gamma models; surfaced a top-20% cohort driving ~90% of predicted revenue — directly actionable for retention or paid-marketing.
- github.com/kuman002/customer-lifetime-value-CLV

EDUCATION & CERTIFICATIONS

B.E. Computer Science & Engineering (Data Science)

Annamalai University, Tamil Nadu
CGPA: 8.26 / 10.0 · Expected May 2026

IBM Certifications — Credly Verified

Machine Learning for Data Science Projects (Mar 2026)
Enterprise Data Science in Practice (Feb 2026)
Data Fundamentals (Sep 2025)

LEADERSHIP & EXTRACURRICULARS

- Workshop Instructor — designed and delivered a Python & data analysis curriculum for 30+ peers; translated complex technical concepts into hands-on exercises with measurable comprehension gains.
- Event Lead (COMPSEM) — owned end-to-end logistics for a technical debate: scheduling, judging criteria, participant communication, and day-of coordination.
- Open-Source Contributor — 36 public GitHub repos with consistent .gitignore hygiene, feature-branch workflow, meaningful commit messages, and MIT licences — engineering discipline beyond coursework.