Tanvir Ahammed

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Professional Summary

Computer Science and Engineering student specializing in AI/ML with hands-on experience building LLM-powered applications, RAG systems, and agentic AI solutions. Strong foundation in machine learning, NLP, and algorithms, with 700+ problems solved on Codeforces (1257 rating). Actively researching multilingual code generation and ML fairness, with proven competitive programming achievements and strong algorithmic foundations.

Technical Skills

Generative AI & LLMs: LangChain, Hugging Face Transformers, LLMs, RAG, ReAct/CodeAct Agents, Agentic AI Systems, Prompt Engineering, LoRA/QLoRA
Machine Learning: Scikit-learn, Model Training & Evaluation, Feature Engineering, Supervised Learning
Data Science & Analytics: Exploratory Data Analysis, Statistical Analysis, Data Preprocessing, Predictive Modeling
Programming Languages: Python, C++, C, Java, JavaScript, SQL
Databases & Vector Stores: FAISS, Vector Databases, MySQL, PostgreSQL, SQLite
Web Frameworks: Streamlit, Django, REST APIs

Projects

Intelligent Document Search using RAG Live Demo | Code

- Built a **RAG**-based PDF Q&A system using **LangChain**, **Groq LLM**, and **FAISS**, delivering source-grounded answers in **under 2 seconds**
- Designed a vector retrieval workflow using **HuggingFace embeddings** and recursive text splitting for multi-document search
- Integrated **Llama 3.1** with retrieval chains to generate context-aware responses while reducing hallucinations
- Deployed a **cloud-ready Streamlit** application supporting **real-time PDF ingestion** and session state management

Text-to-SQL Chatbot (LLM-Powered) Code

- Built an **LLM-powered Text-to-SQL chatbot** using LangChain and Llama 3, enabling natural language queries over relational databases
- Implemented a **ReAct-based SQL agent** that autonomously explores schemas, generates SQL queries, and returns results conversationally
- Built a Streamlit chat interface with **real-time streaming**, persistent history, and cached **SQLite/MySQL** access

Autonomous AI Research Agent Live Demo | Code

- Developed an **AI research agent** using **LangChain** and **Groq LLM**, orchestrating **Wikipedia**, **ArXiv**, and **DuckDuckGo** for autonomous multi-source retrieval
- Implemented an **agentic workflow** with dynamic tool selection and reasoning chains to synthesize information from academic and web sources
- Developed a conversational interface with **real-time streaming**, session state management, and **source attribution**

Student Performance Prediction & Analysis Code

- Developed ML regression model predicting student math scores with 88% accuracy using Random Forest and Gradient Boosting algorithms on dataset of 1000 students
- Performed **EDA**, **feature engineering**, and built scikit-learn **preprocessing pipeline** for handling categorical and numerical variables
- Implemented **modular code structure** with separate pipelines for data ingestion, transformation, model training, and prediction

Thesis & Research

Optimizing Bangla Code Generation (In Progress)

- Developing efficient code generation systems for low-resource languages using **LoRA/QLoRA**, reducing parameters by ∼90% while maintaining comparable performance.
- Implementing and evaluating reasoning-augmented methods **(ReAct/CodeAct)**
- Conducting benchmarking on multilingual code datasets (**500+ samples** from mHumanEval, MBPP), optimizing for efficiency and **cross-language generalization**

ML Fairness in Credit Scoring - Bias Auditing Framework (In Progress)

- Conducting comparative study of machine learning bias across **5+ model architectures** including Logistic Regression, Random Forest, and Gradient Boosting
- Developing open-source toolkit for **automated bias detection** in lending models, enabling compliance with regulatory fairness standards
- Applying **explainable AI** (SHAP, LIME) to identify root causes of discriminatory predictions, analyzing **10+ fairness metrics** across protected attributes

Achievements

Codeforces Rating: **1257** | **700+** Problems Solved — **Codeforces**
3rd Runner-Up – GUB CSE Carnival *(2024)*
2nd Place – Intra University Programming Contest *(2024)*

Training & Certifications

AI / Machine Learning Course – Phitron *(Ongoing)*
5-Day In-Person AI/ML/IoT Bootcamp – Bondstein *(2025)*
Competitive Programming Course – CPS Academy *(2024)*
CSE Fundamentals – Phitron *(2022)*

Education

B.Sc. in Computer Science and Engineering *(Expected June 2026)*
Green University of Bangladesh

- CGPA: 3.57/4.00 (1 Semester remaining)

Higher Secondary Certificate (Science) *2019*
Chowgacha Government College

- GPA: 5.00/5.00

Secondary School Certificate (Science) *2017*
Jagodishpur Mirzapur Ismail Secondary School

- GPA: 4.92/5.00

References

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