Akshath Saxena

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I am Akshath Saxena with BSc Hons Mathematics and Computer Science background specialising in software development, machine learning, deep learning, and quantitative finance. I have applied machine learning and NLP techniques to analyse financial news, extracting actionable insights to enhance trading algorithms and market prediction in quantitative finance. I am seeking challenging opportunities to utilize my skills in Cloud Technology, Software Development and Machine Learning to foster innovation and progress.

Technical Skills

- **Programming Languages:** Python, Java, Kotlin, Scala, SQL, Hive, JavaScript (HTML, CSS), R.
- **Azure Cloud Services:** AI Search, Key vault, Function App, Web App, Azure Analytics Services
- **GCP :** Vertex AI (Gen AI), Cloud Storage, Cloud Run, Gemini
- **Data Analysis Tools:** Pandas, NumPy, SciLearn, QuantLib, Streamlit, TensorFlow, matplotlib.
- **ML algorithms:** LSTM, SVM, K-NN, Linear Regression, Logistic Regression, Random Forest XGBoost, Transformers(BERT) ● **Framework:** Langchain, Pytorch, Hadoop.
- **Operating Systems:** Windows, Linux, Raspbian.
- **General ML Technologies:** Retrieval Augmented Generation (RAG), Graph RAG, Large Language Model (LLM), Vector Database, Prompt Engineering, Machine learning, NLP
- **General Technologies:** Git, GitHub, Oracle, Agile methodology, Unit testing.

Education

BSc Mathematics & Computer Science, University of Greenwich Sept 2022 - Jul 2025

- Predicted First-Class grade *(80%)*.

Work Experience:

• AI Intern | CICET Software Limited | Jul 2024 – Sep 2024

Contributed to the development of a mental health chatbot using various Azure cloud services. Implemented Azure AI Search to retrieve vector-embedded responses, used Azure API Management to securely store and manage sensitive keys like the OpenAI API key, and deployed the chatbot via Azure Web App with a CI/CD pipeline for seamless updates. This project enhanced my skills in cloud architecture, secure API integration, and deployment automation, while also strengthening my ability to build scalable and responsive AI-powered web applications.

• Data Science Intern | ExamChamps | Jul 2023 – Sep 2023

Worked on developing an AI model that analyzes students' past test scores to accurately predict their future grades. This experience deepened my understanding of data preprocessing, feature engineering, and regression models. I also gained hands-on experience with Python libraries such as Pandas, NumPy, and Scikit-learn. Collaborating with the team improved my ability to communicate technical ideas clearly, while debugging and optimizing the model enhanced my critical thinking and problem-solving skills.

- **Python Tutor | Freelance | Sep 2023 – Present**

  Taught Python coding to students aged 9-17, guiding them in creating fun projects. This experience refreshed my Python fundamentals and presentation skills, while helping students solidify their understanding of Python. Additionally, I developed patience, communication, and problem-solving skills through teaching diverse age groups.

- **Maths and English Tutor | Freelance | Jan 2023 – Mar 2023**

  Taught Mathematics and English to year 4 students, developing and delivering lessons focused on key areas for improvement. This resulted in a 10% increase in students' grades and enhanced my presentation skills. Through this role, I also honed my patience, communication, and problem-solving abilities.

Main Projects

Generative AI	Finance	Telco	other
Next-Gen Agentic AI App with GraphRAG & NVIDIA cuGraph	**ML-Driven Portfolio Optimization**	**European Telecoms Network**	**Breast Cancer Detection**
Generative Code Wizard	**Options Pricing Model**	**Next-Gen Agentic AI App with GraphRAG & NVIDIA cuGraph**	**Group Communication System**
Hotel Assistant Using RAG	**Money Laundering Detection**		
Real Estate Assistant using RAG	**News Sentiment Analysis**		
RAG-based Mental Health Chat Application	**Stock Market Prediction**		

Next-Gen Agentic AI App with GraphRAG & NVIDIA cuGraph (LLM, NetworkX, ArangoDB)

- Developed a hybrid graph query engine using LangChain tools to interpret natural language and generate AQL or NetworkX queries automatically.
- Integrated NetworkX graphs into ArangoDB using nx-arangodb, enabling scalable, persistent graph analysis.
- Engineered a LangChain agent powered by LLM (Llama-3) to distinguish between AQL-compatible queries and algorithmic ones.
- Built a dual-mode reasoning framework to execute shortest paths, centrality scores, and community detection through NetworkX or AQL dynamically.
- Automated query-to-code translation with LangChain tools and exec() to analyze complex graph metrics like betweenness, PageRank, and articulation points.
- Enabled real-time graph analytics and user interaction through a multi-agent setup with prompt engineering and hybrid graph tool routing.

ML-Driven Portfolio Optimization (Transformer, Reinforcement Learning)

- Developed a Black-Litterman portfolio optimization model to compute risk-adjusted expected returns.
- Implemented a reinforcement learning (RL) agent using PyTorch and BERT for financial news sentiment analysis.
- Designed a deep transformer network with multi-head self-attention for portfolio allocation.
- Leveraged Scipy for mean-variance optimization and yfinance for real-time stock data retrieval.

- Built an interactive Streamlit dashboard to visualize portfolio performance.

Options Pricing Model (Python)

- Developed a Python script to price AAPL stock options using the Black-Scholes model, integrating and comparing real-time data from Yahoo Finance.
- Gained expertise in financial modelling, data analysis, and practical application of quantitative finance principles.

Money Laundering Detection (Python)

- Created a hybrid model using XGBoost and Random Forest to predict fraudulent transactions.
- Gained insights into gradient boosting, Random Forest, and their real-life applications. • Enhanced prediction capability through a voting classifier and learned hyperparameter tuning with GridSearchCV.
- Balanced an unbalanced dataset using SMOTE (Synthetic Minority OverSampling Technique).

RAG-based Mental Health Chat Application (Python)

- Developed a Retrieval-Augmented Generation (RAG) chatbot to support users' mental well-being, using Python and Streamlit for the frontend. Integrated multiple Azure cloud services including AI Search for document retrieval, Key Vault for secure API key storage, and Azure Web App for cloud deployment.

Generative Code Wizard(Python)

- I built a coding assistant chatbot using GPT-3.5 via LangChain, with a Streamlit UI, hosted on Azure.
- Gained experience with: API, Langchain, OpenAI, Streamlit, Azure services, Deep Learning.

Real Estate Assistant using RAG

- Created a chatbot which helps the user buy a house in US based on his given constraints.
- Gained experience with: REST API, multiple Azure Services, Vector Database, RAG, Streamlit, LLM, Deep Learning, SQL.

Hotel Assistant Using RAG

- This project is very similar to the above, main difference being the database is based on hotels.
- Gained experience with: REST API, multiple Azure Services, Vector Database, RAG, Streamlit, LLM, Deep Learning, SQL.

News Sentiment Analysis (Python)

- Conducted sentiment analysis on financial news articles using Python, applying NLP techniques to extract market sentiment for potential use in algorithmic trading and investment strategies.
- Gained experience in leveraging real-time sentiment data to enhance trading models, risk management, and market prediction in quantitative finance.

Stock Market Prediction (Python)

- I have developed a stock market prediction model using historical data using ML algorithm called LSTM.
- Used Python libraries such as pandas, scikit-learn, and NumPy.

Breast Cancer Detection

- I have used multiple ML algorithms (SVM, K-NN, Linear Regression, Random Forest) for breast cancer prediction using Python.
- Utilized public libraries including pandas, scikit-learn, and NumPy.

Group Communication System (Java)

- End product allows multiple users to communicate in groups or privately.
- Gained experience with: Key programming principles, Usage of design patterns, JUnit testing, and Version Control System (VCS) utilization.

European Telecoms Network (Kotlin)

- Developed a desktop application to display a graph of its Minimum Spanning Tree using AndroidX Libraries.
- Gained proficiency in Kotlin, Androidx GUI for desktop, graph storage and visualization, and returning multiple values from a single function.