# Mariam Asal

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## Summary

Graduate AI Engineer specializing in Large Language Models and intelligent system development.Strong foundation in software engineering, machine learning, NLP, computer vision, and deep learning. Experienced in designing, fine-tuning, and deploying LLM-powered applications using Python, FastAPI, Hugging Face Transformers, and modern ML frameworks. Skilled in Retrieval-Augmented Generation (RAG), model optimization.

## Education

**Egypt Japan University For Science and Technology (E-JUST)** Alexandria, Egypt
*B.Sc.Computer Science and Information Technology* *October 2021 – June 2025*
**Major:** Artificial Intelligence and Data Science

## Experience

**Data Analyst Intern** July 2024 -September 2024
National Telecommunication Institute Alex, Egypt

- Utilized Python (Pandas, NumPy) to clean, preprocess, and analyze large datasets.
- Developed interactive dashboards in Power BI and Excel, using DAX and Power Query to model complex KPIs and calculations.
- Wrote optimized complex SQL queries to extract, filter, and join relational data for reporting purposes.
- Built Tableau dashboards to visualize trends, patterns, and actionable insights.
- Performed web scraping to collect and integrate external data sources for analysis.
- Translated raw data into clear, actionable business insights to support decision-making.

## Projects

**Integrated Heart and Lung Digital Twin** Code

- Designed and implemented a real-time 3D digital twin simulating heart–lung interactions using Python, FastAPI, and Blender.
- Developed backend using SQLite and real-time forecasting models (TFT), and frontend in Three.js/TailwindCSS.
- Integrated clinical metadata and vitals to visualize cardiac deterioration.
- Enabled clinician interaction via a full-stack web interface for monitoring and simulation.

**Website Question Answering Model** Code

- Built a Retrieval-Augmented Generation (RAG) system using LLaMA2 and FAISS for dense document retrieval from website content. Developed data pipelines using web scraping tools.
- Deployed the model via Gardio into a live chatbot interface for interactive QA. Emphasized system design, vector storage, and inference integration.

**Vision-Based Attendance and Emotion Monitoring System** Code

- Developed a smart classroom assistant using face recognition (DeepFace/MediaPipe) for automated attendance and real-time emotion detection (happy, sad, neutral, confused) with on-screen visual feedback and CSV logging.
- Integrated gesture control, OCR (Tesseract) for document reading, and camera calibration (OpenCV), with optional features like email alerts for absentees and emotion analytics visualization.

**Printed Arabic Optical Character Recognition System** Code

- Engineered an OCR system for printed Arabic text using classical ML techniques. Designed preprocessing and recognition pipelines to optimize accuracy and performance, handling script-specific challenges in layout and diacritics. Focused on model optimization and pipeline modularity.

**Stock and Gold Market Trading Model** Code

- Built a stock trading strategy using Decision Transformer for forecasting and RL (PPO, DQN) for decision making on Gold Trading DataSet.

**FMCG-Style Store Performance Dashboard** Code

- Built an interactive Power BI dashboard to analyze sales performance by region, product category, and customer segment. Applied DAX and data modeling to calculate KPIs and enabled business insights through custom tooltips, drilldowns, and filters.

**Retail Sales and Inventory Analysis** Code

- Executed complex SQL queries for inventory and customer analytics, using window functions and joins to uncover sales trends, forecast demand, and optimize stock turnover in an FMCG-like environment.

**Project Management Dashboard** Code

- Designed a Power BI dashboard to monitor project timelines and financial KPIs such as cost savings, income growth, and working capital improvements.
- Enabled data-driven decision-making for project phase tracking and performance evaluation.

**Lifestyle Recommendations System** Code

- Built a recommendation system using collaborative filtering, content-based filtering, and hybrid approaches to suggest food items based on user preferences and nutritional needs.
- Implemented data preprocessing techniques (outlier detection, handling missing values, and normalization) for accurate recommendations.
- Created a knowledge-based recommendation feature to suggest personalized diet plans within calorie limits.

**Cancer Diagnosis Prediction Model** Code

- Developed an SVM model with optimized hyperparameters to classify breast cancer cases. Applied PCA for dimensionality reduction and decision boundary visualization.

**EEG Tumor Detection** Code

- Built EEG classification models using various ML algorithms (Naive Bayes, Decision Tree, Neural Network) to detect tumor patterns in brainwave signals.

## Skills

- **Programming Languages:** Python, C++, JavaScript, SQL (MySQL, Oracle SQL, T-SQL), HTML, CSS, C, R.
- **Software & Backend Development:** FastAPI, REST APIs, SQLite, GitHub, Object-Oriented Programming (OOP), TailwindCSS, Three.js.
- **AI/ML & Frameworks:** Hugging Face, LangChain, PyTorch, TensorFlow, Keras, NumPy, Pandas, Scikit-learn, Matplotlib, Seaborn,FastAPI, REST APIs
- **Tools:** SAS on Demand, Oracle SQL, Microsoft SQL Server, Microsoft Fabric, Microsoft Fabric Data Warehouse, Power BI, Advanced Excel, Pivot Tables, Power Query, Tableau, AWS Cloud Services, Jupyter Notebook, Google Colab, Visual Studio, VS Code, Kaggle, PyCharm
- **Data Skills:** ETL, Data Cleaning, Feature Engineering, Predictive Modeling, Deep Learning, Time Series Forecasting, OCR, Face Recognition, NLP (QA Systems), Recommender Systems.
- **Soft Skills:** Problem Solving, Analytical Thinking, Team Collaboration, Technical Communication, Adaptability, Leadership, Attention to Detail, Time Management.

## Honors and Awards

**The Farouk El-Baz Award – 2nd Place, Scientific Innovations (Robotics and AI Track)**

- Secured national 2nd place among all Egyptian universities for graduation project “Integrated Digital Twin of the Heart and Lungs”; award presented by H.E. Dr Ashraf Sobhy, Minister of Youth and Sports.

## Certificates

- **Oracle Academy: Database Programming with SQL Certificate** Link
- **SAS Programming 1: Essentials Certificate** Link

## Languages

- **Arabic:** (Native) , **English:** (C1), **Japanese:** (Beginner), **French:**(Beginner)

## Extracurricular Activities

**Resala Charity Organization.** September 2023

- Team Collaboration: Organized a caravan aimed at collecting food donations and fundraising events.

**IEEE Biomedical Engineering Community.** October 2020 -May 2021

- Contributed to various projects using Arduino as Arduino Sound Player.

**Robotics community.** October 2022-November 2022

- Worked on various projects such as Maze-solving robot, line-following robot, Hand Follower robot using Sensors and Arduino UNO.