Abdelmonem Sayed Somida

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Objective

Passionate Computer Science student at GIU with strong skills in Java, C++, Python, and Flutter. Seeking internship opportunities to apply skills in software development, Data Science, and cybersecurity.

Educations

New Administrative Capital

German International University (GIU) *10/2023 - 06/2027*

- Achieved an outstanding German GPA (2.13) B

projects

DES Encryption in CBC Mode – Python Project

03/2025

- **Implemented the DES (Data Encryption Standard) algorithm from scratch in Python, processing 64-bit blocks through 16 encryption rounds.**
- **Developed each DES round including expansion, key mixing (XOR), substitution (S-box), and permutation stages, with output tracing at each step.**
- **Extended the implementation to support full-message encryption using CBC (Cipher Block Chaining) mode, managing padding and IV chaining for security.**
- **Utilized helper tools and tables for key scheduling and bit-level operations, demonstrating hands-on experience in cryptographic system design.**
- **https://github.com/Mon3em20/DES-Encryption-in-CBC-Mode.git**

RSA Encryption and Decryption Implementation (Java)

04/2025 - 04/2025

- Implemented RSA key generation with at least 256-bit modulus.
- Encrypted and decrypted files to ensure data security and integrity.
- Developed core RSA algorithm logic manually using Java.
- Delivered a complete encryption-decryption workflow with file handling.
- **https://github.com/Mon3em20/RSA-Encryption-and-Decryption-Implementation.git**

Online Event Ticketing System

Technologies: Node.js, Express.js, MongoDB, React.js, Mongoose, Git/GitHub *03/2025 - Present*

Currently developing a full-stack ticket booking platform that allows users to browse, book, and manage event tickets.

- **Supports role-based access (User, Organizer, Admin) with personalized dashboards.**
- **Implements full CRUD operations and MongoDB data integration.**
- **Features dynamic event filtering, ticket booking, and admin control panels.**
- **Ongoing development with frequent updates on GitHub.**
- **https://github.com/Pedro4O4/masr7.git**

Attack on Titan Game (Java, OOP)

02/2024 - 04/2024

- **Integrated different difficulty levels and random enemy spawning based on the selected mode.**
- **There are 3 types of titans, each with different strengths. They spawn randomly, often target in the weakest lane with the least powerful or fewest weapons.**
- **The objective is to protect each lane from titans using these weapons.**
- **There are three types of titans, each with unique strengths. They spawn randomly and tend to target the weakest lane, where the fewest or least powerful weapons are positioned**
- **https://github.com/Mon3em20/AttackOnTitan.git**

Employee Attrition Data Analysis & Preparation

(Python, Pandas, Matplotlib, Seaborn) *02/2025 - 03/2025*

- Conducted data exploration on the Employee Attrition dataset.
- Inspected dataset shape, data types, and summary statistics.
- Detected and handled missing values, duplicate rows, and outliers.
- Applied filtering, grouping, and binning techniques for data preparation.
- Engineered new features from existing attributes.
- Performed correlation analysis to identify key factors affecting attrition.
- Visualized data using boxplots, histograms, scatterplots, and heatmaps.
- Applied PCA for dimensionality reduction and visualized data pre- and post-transformation.
- **https://github.com/Mon3em20/Employee-Attrition-Data-Analysis-Preparation.git**

Employee Attrition Prediction Machine Learning Classification (Python, scikit-learn)

04/2025 - 04/2025

- Applied KNN, Naive Bayes, and Random Forest classifiers.
- Performed data preprocessing, including encoding and train-test splitting.
- Computed evaluation metrics: Accuracy, Confusion Matrix, Precision, and Recall.
- Compared model performance and selected the best-performing algorithm.
- Applied a Deep Learning model for performance comparison
- **https://github.com/Mon3em20/Employee-Attrition-Prediction-Machine-Learning-Classification.git**

Customer Segmentation with Clustering Techniques (Python, Data Science)

05/2025

- Applied multiple clustering algorithms: K-Means, Hierarchical, GMM, and BIRCH.
- Segmented customers based on demographics and spending behavior.
- Utilized PCA for 2D data visualization of clustering results.
- Used the elbow method to determine the optimal number of clusters.
- Evaluated clustering models using Silhouette Score and Davies-Bouldin Index.
- Interpreted results to identify the most effective clustering strategy.
- **https://github.com/Mon3em20/Customer-Segmentation-with-Clustering-Techniques-Python-Data-Science-.git**

Multi-Core Execution System Implementation

05/2024 - 06/2024

- Designed and implemented a multi-core execution system using a master-slave architecture in Java.
- Developed components including a shared memory system, process control blocks (PCBs), and a ready queue for efficient task management.
- Implemented and tested Round Robin and Shortest Job First (SJF) scheduling algorithms for process execution.

- Ensured thread-safe operations for variable assignments, arithmetic calculations, and print commands.
- Conducted execution monitoring and debugging to validate accuracy, robustness, and efficiency of the system.
- **https://github.com/Mon3em20/Multi-Core-Execution-System-Implementation.git**

Memory Match Card Game (c++)

11/2024 - 12/2024

- Developed a console-based turn-based game in C++ for two players, implementing features like dynamic card flipping, scoring, and special card behaviors (Bonus and Penalty cards).
- Designed and implemented core components, including classes for cards (Standard, Bonus, Penalty), players, deck, and game mechanics.
- Created functionality for turn management, grid visualization, and dynamic memory handling for efficient gameplay.
- Integrated advanced gameplay logic for special cards to enhance user experience and scoring dynamics.
- Delivered a robust system to track player scores, announce winners, and handle game-ending scenarios.
- **https://github.com/AhmedhassanB/Memory-MatchCard-Game.git**

Gamified Personalizable Educational Platform (SQL)

10/2024 - 12/2024

- Collaborated on designing and developing a web-based educational platform that integrates gamification to enhance learner engagement.
- Implemented key features, including personalized learning paths, collaborative quests, assessment management, and real-time leaderboards.
- Designed a secure user management system for learners, instructors, and administrators, supporting features like account creation, profile updates, and role-specific functionalities.
- Developed modules to track learner progress, manage emotional feedback, and analyze performance trends to support well-being and personalized learning experiences.
- Utilized SQL Server for database management, ensuring efficient data handling for user profiles, courses, and assessments.
- Delivered a seamless and interactive user experience by integrating functionalities across all platform components.
- **https://drive.google.com/file/d/1EBVCQt36RvUTASxXcSSg9Sfe5aKhf2ZY/view?usp=drive_link**

Supermarket (JAVA - OOP)

04/2024 - 04/2024

- Implemented custom exceptions to validate customer preferences for fat and sugar levels in a supermarket system.
- Enhanced the Customer class with read-only attributes for customer preferences.
- Built a GUI for the supermarket application using JavaFX and MVC design.
- Added features like dynamic cart updates and user alerts for out-of-stock products.
- **https://github.com/Mon3em20/Super-market-GUI-**

Bi-Directional Chat Application with TCP Analysis

05/2024 - 05/2024

- Designed and implemented a client-server chatting application using Java socket programming.
- Established bi-directional communication across networks, ensuring reliable data exchange.
- Conducted TCP packet tracing and analysis using Wireshark to study network behavior.
- Demonstrated skills in networking, protocol implementation, and cross-network debugging.
- **https://github.com/Mon3em20/Bi-Directional-Chat-Application-with-TCP-Analysis**

Binary Tree Search and Representation Conversion(MIPS)

05/2024 - 05/2024

- Implemented depth-first search (DFS) and breadth-first search (BFS) algorithms for binary trees.
- Utilized two distinct array-based representations of trees.

- Designed and implemented procedures to convert between the two representations.
- Optimized search functionalities for both tree formats.
- Documented the implementation in a detailed technical report as comments .
- Collaborated with a team to successfully complete the project.
- **https://github.com/Mon3em20/Tree-Search-and-Conversion**

Skills

- Communication Skills
- C++
- symmetric encryption standards (DES, AES)
- modes of operation (e.g., ECB, CBC, CFB, OFB)
- Familiar with asymmetric encryption algorithms (RSA)
- Implementation of Message Authentication Codes (MAC)
- user authentication mechanisms
- Data Structure & Algorithm (Java)
- Git & GitHub Collaboration
- Dart
- GUI
- MIPS
- UML Diagrams & System Design
- Basic Software Testing & Debugging
- Data Analysis
- PCA
- Model Evaluation Metrics
- Exploratory Data Analysis
- Java
- Python
- Agile methodologies
- Knowledge of stream ciphers and key stream generation
- Knowledge of cryptographic hash functions (SHA, MD5)
- Familiar with key management techniques and PKI
- Basic knowledge of blockchain technology
- Database Design (SQL, MongoDB, NoSQL)
- Full Stack Web Development (Node.js, Express, React)
- Flutter
- HTML
- Software Development Life Cycle (SDLC)
- Concurrency & Multithreaded Programming
- UI/UX Principles & Frontend Technologies
- Clustering Algorithms (K-Means, GMM, BIRCH)
- Data Visualization
- Data Preparation & Cleaning (Python, Pandas)
- Correlation Analysis & Heatmaps

Courses

English (B1- B2)

British council & The American University In Cairo *07/2020 - 09/2024*

German (A1-A2)

German International University (GIU) *10/2023*

Flutter

freeCodeCamp.org *07/2024 - 08/2024*

Languages

Arabic
Native Speaker

English – B2
Hign Proficient

German: A2
Good Command