# Ali Mohsen Abd El-Monsef

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## Summary

- **Versatile programmer with a successful track record of tackling complex projects & problem solving.**
- **Designed and implemented a university library website, using software engineering principles and web technologies.**
- **Collaborated effectively in a team during the projects.**
- **Passionate about continuous learning, particularly in exploring data science and machine learning.**

## Education

**Bachelor of Computer Science,** Cairo University
GRADUATION YEAR 2026, GPA: 3.84

## Skills

Languages: C++, Python, Java, Javascript, html, CSS Technologies: MySQL,
Git.
key skills: OOP, OOA&D, data structures & algorithms, problem solving, ASP.net.

## Projects

- **Image Filtering Project (C++)**
  - Developed an image filtering console application with 15+ filters (e.g., black and white, mirroring, edge detection) using C++.
  - Result: Improved image manipulation capabilities for any type of image, whether it's greyscale or RGB.
- **BigReal Data Type Implementation (C++)**
  - Designed and implemented a custom data type for handling large real numbers without overflow.
  - Utilized object-oriented programming (OOP) principles to create a robust and efficient solution.
  - Result: Enabled precise arithmetic operations on extremely large numbers.
- **BoardGames System (C++)**
  - Developed a console-based board games system (e.g., Tic-Tac-Toe, Connect Four) with an AI opponent, then designed a GUI for it.

- Implemented the Minimax algorithm with alpha-beta pruning for optimal move selection.
- Result: Gained insights into game AI, algorithm optimization, and OOP design.

- **University Library Website (HTML/CSS/JS, APIs & Django)**
  - Collaborated on designing and implementing a web-based library system using Django framework.
  - Created use case diagrams, sequence diagrams, and class diagrams using software engineering principles.
  - Designed an ERD for the database.
  - Result: Improved teamwork, web development and backend skills, and design principles.

- **LMS** - *team project* **(Spring Boot, MySQL, Git)** 12/2024 - 12/2024
  - Developed a Learning Management System (LMS) using **Spring Boot** for back-end services and **MySQL** for database management.
  - Collaborated with a team to design and implement core functionalities, including user authentication, course management, and assignment submission.
  - Created **use case diagrams, sequence diagrams, and class diagrams** following software engineering best practices.
  - Designed an **ERD** to model database relationships efficiently.
  - **Result**: Enhanced skills in **Spring Boot development, database design, version control (Git), and team collaboration**.

- **CMD Simulator** - *team project* (**JAVA**)
  - Developed a **Command Line Interface (CLI) simulator** using **Java**, mimicking basic terminal commands and file system operations.
  - Implemented features such as **file navigation, creation, deletion, and command execution** using object-oriented programming principles.
  - Developed **JUnit tests** to ensure that all project functionalities work correctly.
  - **Result**: Strengthened **Java programming, problem-solving, and team collaboration** skills while gaining experience in system simulation.

- **CPU Scheduler simulation** - *team project* (**JAVA**)
  - Developed a CPU scheduling simulator in Java to demonstrate various scheduling algorithms, including Priority Scheduling, Shortest Job First (SJF), and Shortest Remaining Time First (SRTF).
  - Implemented object-oriented principles to structure classes such as CPU, Process, and different scheduling strategies.
  - Designed and built a graphical user interface (GUI) to visualize process execution and scheduling timelines.
  - Ensured modularity and maintainability by following software engineering best practices.

- Result: Gained practical experience in process scheduling, Java GUI development, and software design pattern.

- **Data Structures Implementation – Individual** (**JAVA**)
  - Implemented fundamental data structures, including B-Trees, Red-Black Trees (RBT), Skip Lists, and Suffix Arrays using C++/Java.
  - Designed and optimized algorithms for efficient insertion, deletion, and search operations across different structures.
  - Followed object-oriented programming (OOP) principles to ensure code modularity and reusability.
  - Managed version control using Git, maintaining structured commits and documentation in README.md.
  - Result: Strengthened problem-solving skills and deepened understanding of advanced data structures and their real-world applications.