Mahmoud Zarouane *Software Engineer*

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Profile

As a dedicated software engineering student with a passion for solving complex problems, I bring a strong foundation in algorithms and data structures.

I am seeking opportunities to leverage my technical skills and passion for coding in a dynamic software engineering role.

Education

2022/09 – Present	**Software Engineering** *TEK-UP University*

Competitions

2023/06	**TCPC 2023** Ranked 49 out of 90 teams.
2023/10	**IEEEXtreme 17.0** Ranked 21 out of 1048 in Tunisia. Ranked 849 out of 8263 Worldwide.
2024/02	**Code Blinders** Ranked 30 out of 80 teams.
2024/09	**TCPC 2024** Ranked 29 out of 80 teams.

Certificates

Oracle Certified Associate, Java SE 8 Programmer ⧉
Issued Sep 2025

Projects

2024/05	**Inventory Management System** Developed a desktop application using python and the tkinter GUI as well as sqlite for the database management.The system allows users to manage stock items by adding, deleting, updating, and searching for items in the database <u>WHAT I LEARNED :</u> Through this project i leanred how to create a desktop user interface using tkinter framework as well as apply the 4 functionnalities of a CRUD application.
2024/12	**Linux shell** Implemented a program in C for linux users that mimics some basic functionalities of a unix like shell such as command execution process creation, piping, commands history and redirection. <u>WHAT I LEARNED :</u> Through this project i gained hands on experience with process lifecycle, system calls and parent-child process relationships and this helped me deepen my understanding of how linux works under the hood,

| 2025/05 | **Online coaching web application** |
| | Developed a web application for managing personalized sports coaching. It allows users to register as clients or coaches, search for coaches based on various criteria, book sessions, and manage their profiles. The platform includes features such as authentication, session booking, and user dashboards for both clients and coaches. |

WHAT I LEARNED :

- OOP in PHP : How to design and use classes to represent users, coaches, and sessions, encapsulating logic and data for each entity.
- Authentication & Authorization : Implementing secure login and registration using POST requests, password hashing, and checking credentials against a database.
- Session Handling : Using PHP sessions to persist user data after login, enabling personalized and secure user experiences.
- Database Interaction : Using PDO for secure database connections and queries, including CRUD operations for users and reservations.
- MVC-like Structure : Separating concerns by organizing code into classes (models), PHP pages (views/controllers), and assets (JS/CSS).

| 2025/06 | **AI-Powered Development Assistant** |
| | Developed a conversational AI chatbot using FastAPI (backend) and React (frontend) that acts as a virtual chef, capable of providing cooking guidance and personalized recipe suggestions. Integrated document-based knowledge retrieval with LangChain to enable contextual understanding of cooking instructions. Implemented chat history for improved user experience and continuity. |

WHAT I LEARNED :

- Backend Development : Strengthened understanding of building APIs using modern frameworks, handling requests, responses, and data validation effectively.
- Frontend Development : Improved skills in creating interactive user interfaces, managing state, and ensuring smooth user experiences in web applications.
- AI Integration : Gained practical experience integrating AI models into real-world applications, focusing on generating context-aware and relevant responses.
- Context Management : Learned techniques for maintaining conversation history to provide more coherent and personalized chatbot interactions.
- Full-Stack Communication : Developed better knowledge of connecting frontend and backend systems through structured data exchange and asynchronous operations.

Programming languages

JAVA	● ● ● ● ●	Python	● ● ● ● ●
C++	● ● ● ● ○	Javascript	● ● ● ○ ○
PHP	● ● ● ○ ○		

Organizations

2022 – present	**ACM TEK-UP**
	Problem solving trainer
2023 – present	**IEEE TEKUP Student Branch**
	Member

Languages

| **English** | **French** | **Spanish** |
| Fluent | Fluent | Basic |