

# Abdelfattah Berkach

Software Developer

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## Professional Summary

Software developer with expertise in low-level programming, system architecture, and full-stack development. Advanced through 1337 Coding School (42 Network), building shell interpreters, 3D graphics engines, containerized applications, and IRC servers. Strong experience in concurrent programming, network protocols, and object-oriented design.

## Technical Skills

- **Languages:** C, C++, Python, Shell Scripting, JavaScript programming, WebSockets
- **Core Skills:** OOP, Data Structures, Algorithms, Multi-threading
- **DevOps:** Docker, Containerization, Virtualization, System Administration
- **Web**
- **Tools:** Git, Make, CMake, Bash
- **Network:** Front-end Development, TCP/IP, Socket Pro-

## Education

1337 Coding School (UM6P — 42 Network) October 2022 – Present  
*Advanced Program in Computer Science*

## Key Projects

ft\_irc — Network Programming — Sep 2024  
*C++, Socket Programming*  
Developed a fully functional IRC server in C++, supporting user authentication, real-time messaging, and advanced multiplexing techniques. Implemented channel management and protocol handling to ensure seamless communication.  
**Keywords:** TCP/IP, Multithreading, Event-Driven Architecture, Client-Server Model

Minishell — System Programming — Sep 2023  
*Process Management, Parsing*  
Designed and implemented a Unix shell from scratch, featuring built-in commands, redirections, pipes, and process handling. Integrated signal management and error handling to create a stable CLI.  
**Keywords:** System Calls, Fork, Exec, Pipe, File Descriptors, Signal Handling

Philosophers — Concurrent Programming — Aug 2023  
*Multithreading, Synchronization*  
Implemented the classic dining philosophers problem using mutexes and semaphores to manage concurrency. Optimized thread execution to prevent deadlocks and starvation.  
**Keywords:** Thread Synchronization, Mutex, Semaphore,

Race Condition Prevention  
cub3d — 3D Graphics — Nov 2023  
*Raycasting, Game Development*  
Built a 3D rendering engine inspired by Wolfenstein 3D using raycasting. Implemented texture mapping, movement physics, and player interaction.  
**Keywords:** Computer Graphics, Raycasting, Rendering Optimization, Collision Detection

ft\_transcendence — Web Game App — Jan 2025  
*Next.js, React, Tailwind CSS*  
Developed a multiplayer web application with real-time gameplay, authentication, integrated chat system, and responsive UI.  
**Keywords:** WebSockets, Full-Stack, OAuth Authentication, Real-Time Communication

Inception — DevOps — Oct 2024  
*Docker, Nginx, MariaDB, WordPress*  
Created a fully containerized infrastructure using Docker with microservice architecture. Configured a secure Nginx reverse proxy and optimized MariaDB performance.  
**Keywords:** Orchestration, Virtualization, System Security, Container Networking.1cm

## Languages

Arabic (Native) English (Fluent) French (Intermediate)