RAHUL KARMAKAR

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EDUCATION

Hooghly Engineering and Technology College 08/2021 – 07/2025
B.Tech in Computer Science and Engineering - ***CGPA - 9.02*** *Hooghly, India*

PROJECTS

CodeSandbox ⬈ Github 🌐Live **07/2025**

Tech Stack: MERN, WebSocket, Tailwind, Vercel, AWS EC2, Docker, Redis

- Built a secure, multi-language code execution platform supporting languages like C, C++, Python, Java, TypeScript, and JavaScript.
- Designed a queue-based architecture using **Redis** to manage concurrent code execution requests with isolation and resource control.
- **master, workers** run on **EC2** instances in Docker containers for sandboxing.
- Integrated **WebSocket** for real-time execution feedback and REST endpoints for code submission and result retrieval.
- Implemented security measures like **container isolation, execution timeouts, and memory limits** to prevent abuse and ensure system stability.

NeoChat ⬈ Github 🌐Live **08/2024**

Tech Stack: MERN, WebSocket, Cryptr, Tailwind, Cloudinary, Vercel, AWS EC2, Docker

- Developed a real-time chat web application with key features like **encrypted messaging, file sharing with download capability, and user-created channels and groups.**
- Implemented JWT-based secure **user authentication** and real-time **online/offline** status tracking.
- Integrated **debouncing for efficient user search** and displayed last message with timestamp for each contact.
- Utilized Cloudinary for seamless media storage and management.
- Hosted on **Vercel and AWS EC2 with Docker** for scalable and efficient deployment.

StudyNotion ⬈ Github 🌐Live **12/2023**

Tech Stack: MERN, Tailwind, Cloudinary, Vercel, AWS Lambda, API Gateway, Serverless

- A full stack EdTech web app with three distinct user roles: **Student, Instructor, and Admin.**
- Developed features for Instructors to **create/manage courses**, Students to **purchase/review courses**, and Admins to **manage categories and handle administrative tasks.**
- Integrated **Razorpay** for payment processing and implemented robust user authentication with **email notifications.**
- Designed distinct dashboards for each user role and ensured a **fully responsive design** with media storage managed by **Cloudinary.**
- Hosted on **Vercel and AWS Lambda (serverless)** for scalable deployment.

COURSEWORK / SKILLS

- Data Structures & Algorithms
- Database Management System (DBMS)
- OOPS Concept
- Web Development

TECHNICAL SKILLS

Languages: Python, JavaScript, TypeScript, Java, C++, C

Databases: MySQL (SQL), MongoDB (NoSQL)

Technologies/Frameworks: HTML, CSS, ReactJS, NextJS, NodeJS, ExpressJS, AWS, Docker, CI/CD (GitHub Actions), Git, GitHub, Linux

ACHIEVEMENTS

- Ranked **853rd** in **TCS CodeVita Season 12**.
- Developed **jwt-auth-utility** — a lightweight Node.js package for JWT token management.
- Developed **encryptor-e2e** — a Node.js library that provides easy end-to-end messaging by combining RSA key exchange with AES encryption for secure send/receive operations.