



AYUSH RAJ | IIT Kharagpur

Bachelor of Technology in Mining Engineering

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EDUCATION

Year	Degree/Exam	Institute	CGPA/Marks
2026	Dual Degree 5Y	IIT Kharagpur	7.70 / 10
2020	Class XII, BSEB	D.C Inter College, S.B.Pur	88.2%
2018	Class X, BSEB	+2 High School, S.B.Pur	80.4%

INTERNSHIPS

Software Developer Intern AuxVent	May '25 - Jul '25
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Supervisor: Prof. B.S. Sastry, IIT Kharagpur

- Developed a **full-stack software** to **optimize** fan selection, **quantity**, and duct type and **dimension** in auxiliary ventilation systems
- Automated input data generation** for ventilation networks, transforming **hours of manual** work into **instant**, error-free execution
- Migrated a complex **Network Analysis Program** from **Fortran** to **Java**, creating a user-friendly application with improved functionality
- Engineered **Binary Search** algorithm to evaluate fan and duct setups, identifying **cost-efficient** and **safety-compliant** configurations
- Integrated an AI-powered **chatbot** to provide in-app assistance, **answering user queries** about **software features** and usage workflows
- Deployed the application on **AWS Elastic Beanstalk**, accessible at the public domain auxventapp.eu-north-1.elasticbeanstalk.com

PROJECTS

AI - Powered Quiz Application	Nov '25 - Present
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- Developing a **software** product, a **quiz app** to facilitate quiz creation, participation, and evaluation for academic educators and learners
- Integrating Groq's **Llama 3 model** to dynamically generate quizzes through **prompts**, enabling customizable distribution of topics
- Architecting a **secure backend** using **Spring Boot** and **Spring Security**, handling authentication, authorization, and team management
- Utilized **MySQL** for efficient data storage, ensuring **consistency** and integrity of all quiz data, user activity, and performance records

Black Diamond Wash App	Feb '25 - Apr '25
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- Developed an application to **analyze coal washability curves**, reducing complex calculations and **manual multi-curve plotting**
- Employed **Apache POI** library to process **float-sink test data** from an **Excel** file and generate structured, user-friendly analytical outputs
- Executed **cubic spline interpolation** algorithm to estimate **specific gravity of separation** point on washability curves

Vent Chatbot AI Assistant	Dec '24 - Feb '25
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- Developed a **chatbot** using Groq's Llama 3 model and **Retrieval-Augmented Generation** for conversational support on mine ventilation
- Implemented advanced text processing, chunking, and **Pinecone** Vector Storage to optimize the speed and relevance of responses
- Engineered a **history-aware retriever** to retain conversational context and integrated a **feedback mechanism** to enhance system accuracy

Smart Contact Manager	May '24 - Nov '24
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- Developed **secure user authentication** features with email-password verification and **OAuth-based Google login** for seamless access
- Designed and implemented **CRUD** functionalities for managing contacts, leveraging Spring Data JPA to interact with relational databases
- Integrated email communication within the platform by enabling users to **send emails directly** through the **JavaMailSender** interface
- Utilized the Hibernate ORM module to **map database** tables with Spring Bean, simplifying data persistence and reducing boilerplate code

SKILLS AND EXPERTISE

- Languages:** Java (Proficient) | Python | C | JavaScript (Basic) | HTML | CSS | SQL • **Frameworks:** Spring | Spring Boot | Hibernate
- Developer Tools:** Core Java | OOP | Microservices | System Design | DBMS | Java EE | MySQL | Git | Github | REST APIs
- Coursework:** Object Oriented Programming | Programming and Data Structures | Probability and Statistics | File Organization and Database Systems | Computer Organisation and Architecture | Quantitative Decision Making | Mineral Economics and Business

AWARDS AND ACHIEVEMENTS

- Solved over **1000** problems in **Data Structures and Algorithms** across platforms, including LeetCode, GFG, CodeChef, and Codeforces
- Completed over **2300** submissions on LeetCode with a consistent **70% acceptance** rate and achieved a peak **contest rating of 1724**
- Achieved distinction in the prestigious Pre-Regional **Mathematics Olympiad**, ranking among the **top 1920** students **nationally**
- Secured **All India Rank 371** in GATE 2025, placing in the **top 5%** in one of India's most competitive exams for engineering students

CERTIFICATIONS

Data Structures and Algorithms with Java Apna College	May '23 - Aug '23
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- Completed 16 weeks of training in **DSA**, **OOPS**, and Puzzles, and learnt advanced topics such as graphs, segment Trees, binary Trees, etc
- Learnt to apply diverse **problem-solving** paradigms, including Greedy, Divide and Conquer, Dynamic Programming, Binary Search, etc

Training of Spring Boot and Spring Framework Udemy	Dec '23 - Jan '24
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- Built and deployed **enterprise-grade applications** using **Spring Boot Framework** on **AWS Cloud**, employing Git for **version control**

POSITIONS OF RESPONSIBILITY

Coordinator Students' Welfare Radhakrishnan Hall of Residence	Aug '23 - Apr '24
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- Served on the **Institute Welfare Subcommittee**, actively advocating for the well-being of **600+ boarders** at RK Hall of Residence
- Led a team of **39 wing representatives** to strengthen mental health surveillance and promote awareness at a micro level

EXTRA CURRICULAR ACTIVITIES

- Proudly represented my school in prestigious **quiz** and **essay** competitions across block, district, state, and **national** competitive forums
- Over **150+** hours of social service involving **teaching**, promoting cleaning awareness as a part of **National Service Scheme**, IIT Kharagpur

!Self declared by the student, CDC could not verify the relevant documents