

# SUMIT SINGH RANA

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## Education

### Graphic Era Hill University, Bhimtal

2022 - Present

B.Tech in Computer Science & Engineering

8.01/10 CGPA

## Relevant Coursework

- Data Structures
- DBMS
- Algorithms
- Operating System
- Web Development

## Experience

### We Code - Coding Club, Graphic Era Hill University

Bhimtal, Uttarakhand

Mentor

- Mentored and guided over 100+ students in Data Structures and Algorithms (DSA), providing personalized support and structured learning paths.
- Conducted coding challenges, doubt-solving sessions, and code reviews to improve students' problem-solving and coding proficiency.

## Projects

### Realtime Chatroom Platform | HTML, CSS, JavaScript, Node.js, MongoDB, Socket.io

- Built a full-stack real-time chat application with secure login, public/private rooms, and WebSocket-based messaging using Socket.io, enabling  $\approx$ 100ms message delivery.
- Implemented JWT-based authentication and room-level access controls, enhancing user data security and session management by 70%.
- Deployed scalable, cross-device compatible frontend and backend on Vercel and Render, achieving 99.9% uptime and seamless browser accessibility.

### Bus Allocation System | React, Node.js, MongoDB

- Designed and composed a bus allocation system to streamline college transportation, enabling students to search for buses by plate number or location, reducing search time by 40%.
- Integrated MongoDB for real-time data management and optimized UI/UX with React and Tailwind CSS, improving system performance by 35%.
- Implemented dynamic route filtering and time-based bus availability, enhancing efficiency and user convenience by 50%.

### AST-Based Syntax Checker and Visualizer | Python, C, PyQt6, Graphviz, MongoDB

- Built a desktop application supporting Python and C code syntax analysis and AST visualization, reducing debugging effort by 60% through real-time code parsing.
- Integrated Python's ast module and pycparser for C to detect syntax and runtime issues, and visualized code structure using Graphviz with color-coded node hierarchy.
- Developed a modern PyQt6 GUI with language selector, dark mode, and scrollable AST output, enhancing accessibility and user experience by 50%.

## Technical Skills

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

**Frontend:** React.js, Tailwind CSS, HTML, CSS, Bootstrap

**Backend:** Node.js, Express.js

**Cloud & Databases:** AWS, MongoDB, PostgreSQL, MySQL

**Web Technologies:** Socket.io

**Developer Tools:** VS Code, Postman, Git, GitHub

## Extracurricular

- Resolved an average of 4 challenging problems per week on competitive coding platforms, improving efficiency in code implementation.
- Led the execution of a BGMI Esports Tournament across 4 campuses with 60+ teams (240+ participants), overseeing team selection, inter-campus coordination, and final match operations.
- Organized a hackathon with 50+ participants, managing event logistics and coordination.