



# Sudhanshu

Bachelor of Technology  
in Mechanical Engineering  
Indian Institute Of Technology, Ropar

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GitHub | Website  
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## EDUCATION

Degree	Institute/Board	CGPA/Percentage	Year
Bachelor of Technology	Indian Institute of Technology, Ropar	7.29 (Till 4th Sem)	2023-2027
Senior Secondary	Rajasthan Board of Secondary Education	84.40%	2022
Secondary	Rajasthan Board of Secondary Education	91%	2020

## PROJECTS

- **Checkers Game** April 2025 - June 2025  
*C++, 2D Array, Graph, Minimax Algorithm*  
– Developed a checkers game in C++ using a 2D array to represent the board and unique values for pieces.  
– Implemented turn-based moves, capturing, promotion, and game end conditions.  
– Used the minimax algorithm with fixed-depth search for an optimal AI opponent. **GitHub**
- **CoSketch** March 2025 - June 2025  
*Web Development Project*  
– CoSketch: Developed a real-time collaborative drawing application enabling multiple users to sketch together with live updates and session persistence.  
– Frontend: Built with React, TypeScript, and HTML5 Canvas, integrating WebSocket connections for sub-100ms synchronization of drawing events.  
– Backend: Designed a Node.js/Express API and WebSocket server for room management, message broadcasting, and user presence, backed by a PostgreSQL database. **Visit Site | GitHub**
- **KD-Tree** Oct 2024 - Dec 2024  
*C++, Data Structure and Algorithms, KD-Tree, KNN, Median of Medians*  
– Implemented a KDTree in C++ to efficiently find the nearest k d-dimensional points to a specified d-dimensional point with an average time complexity of  $O(k \log k * d \log n)$ .  
– Achieved a creation time complexity of  $O(d * n \log n)$  from an array or vector using algorithms like Median of Medians. Priority Queue was used to perform the search of k Nearest Neighbour to a point. **GitHub**

### Minor Projects

- **Branch-predictor**  
– Implemented a C++ branch predictor to enhance instruction execution and branching efficiency. **GitHub**
- **Codeforces Analysis API**  
– A API that delivers detailed analytics on Codeforces problems, user submissions, and contest performance. **GitHub**  
– Implemented using HTML, CSS and JavaScript.
- **Chat App**  
– A responsive real-time chat app. **Visit Site | GitHub**  
– Built with WebSockets for instant messaging, user presence and message history.

## TECHNICAL SKILLS

- **Programming Languages:** C++, Python, Rust, JavaScript, TypeScript, SQL, Arduino.
- **Development tools:** Git, GitHub, Code Editor ( VS Code, Cursor), Postman.
- **WebDevelopment:** HTML, CSS, JavaScript, Tailwind CSS, TypeScript, React, NextJs, NodeJs, Postgress, Prisma, Monorepo, MongoDB, WebSocket, Pub Subs(Redis), Poem, Tokio, Serde, Diesel.
- **Devops:** CI/CD pipeline, Docker, Nginx(Reverse Proxies), Certbot(certificate management), Process Management(PM2), Newrelic, Prometheus and Grafana, AWS(EC2), Digital Ocean, Serverless(Cloudflare), Kubernetes(K8s).
- **Competitive Programming:** Quite experienced in competitive programming and have a good grasp on data structures and algorithms.

## KEY COURSES TAKEN

- **Mathematics:** Probability and Statistics, Linear Algebra and Integral Transforms, Calculus, Differential Equations.
- **Mechanical:** Theory of Machines, Fluid Mechanics, Solid Mechanics, Thermodynamics, Engineering Mechanics.
- **Others:** Introduction to Computing and Data Structures, Economics, Basic Electronics.
- **Additional Certified Courses:** Web Development, DevOps.

## MISCELLANEOUS

- **Achievement 1,** Website Development Internship | **Link** 2025
- **Achievement 2,** Secure AIR 9863 among 150K candidates in JEE Advance | **Link** 2023
- **Achievement 3,** Get 98.18 percentile in JEE Mains | **Link** 2023
- **Specialist on Codeforces,** Max Rating 1497 on handle Sudhanshu\_Gaur | **Sudhanshu\_Gaur** 2025
- **3 Star on Codechef,** Max Rating 1765 on handle sudhanshu\_g | **sudhanshu\_g** 2025