SONAL SINGH

Mobile: +91-6372202800 || Email: sonal1201kumar@gmail.com || LinkedIn: sonalsingh1201 || GitHub: github.com/sonal1201

Skills

Languages: C++, Python, JavaScript, TypeScript
Frameworks: HTML and CSS, React, Node.js
Databases: MongoDB, MySQL
Core CS Concepts: Algorithms Analysis, Operating System(OS), Data Structures, Networking, Database (DBMS).
Miscellaneous : Linux, Shell (Bash), Git, Vs code, Prompt Engineering, Docker.

Projects

Coding Platform Backend System. [LINK] **Jan 2024**

- **Microservices Architecture:** Engineered a scalable, high-availability platform deployed on AWS with auto-scaling and load balancing.

  Problem Management: Developed a Problem Admin Service (JavaScript, Express, MongoDB) for efficient problem CRUD operations with test cases and code stubs.
- **Executor Service:** Conceived a multi-language code execution service (TypeScript, Docker) using Strategy and Factory patterns for optimized execution environments and TLE handling.
- **Asynchronous Communication:** Implemented a high-performance Submission Service (Fastify) with Redis queues and WebSocket integration for real-time feedback.

  AWS Deployment: Ensured reliability and performance through monitoring, fault tolerance, and auto-scaling.
- **Tech Stack:** Node.js, Express.js, TypeScript, Fastify, MongoDB, Redis Queue, Docker, WebSocket, JWT Authentication.

Uber Ride Booking Backend. [LINK] **Nov 2024**

- **Scalable Architecture:** Designed a high-performance backend supporting real-time ride booking and driver notifications.
- **Distance-Based Ride Matching:** Devised a progressive radius expansion algorithm that prioritizes drivers within 5 km and gradually extends the search up to 50 km if no driver is available.
- **Location-Based Matching:** Utilized driver coordinates and leveraged geospatial queries to efficiently match riders with nearby drivers.
- **Secure Authentication:** Implemented JWT authentication with RBAC to regulate access for customers and drivers.
- **Performance Optimization**: Improved API response time through caching, indexing, and optimized database queries.
- **Tech Stack:** Node.js, Express.js, MongoDB, Redis, Socket.io, RESTful APIs.

Mall Customer Segmentation. **Oct 2024**

- **Customer Segmentation with K-**Means: Built a clustering model to group customers based on spending patterns and demographics. Employed data preprocessing for cleaning and normalization, enhancing accuracy.
- **Behavioral Analysis:** Investigated customer trends using PCA, uncovering insights for targeted marketing strategies.
- **Data Visualization:** Produced insightful visual representations of cluster distributions with Matplotlib, aiding businesses in refining segmentation approaches.
- **Tech Stack**: Python, K-means Scikit-learn, Pandas, Matplotlib**.**

Certification

- **Certification in Cloud Computing** (NPTEL) **Nov 2024**
- **Design and Analysis of Algorithms** (Coursera) **May 2024**
- **Generative AI for Everyone** (Coursera) **May 2024**

Extracurricular Activity

GitHub Student Club | Active Member:

- Contributed to 5+ open-source projects and participated in coding workshops.

DSA Contests & Coding Challenges:

- Tackled 350+ LeetCode problems, consistently participated in contests to enhance efficiency and algorithmic skills.

Active Participant in Campus Sports Events:

- Showcased strong sportsmanship and commitment by participating in college-level tournaments.

Education

Lovely Professional University, Punjab, India **Aug 2022 – July 2026**

- *Branch: Computer Science and Engineering* | **CGPA:7.07**