Term: Fall 2023 **Subject:** Computer Science & Engineering (CSE) **Number:** 512

Course Title: Distributed **D**atabase **S**ystems (CSE 512)

GROUP PROJECT TOPIC PROPOSAL

<table>
<tr><td>Team Name</td><td colspan="2">Name of the Project</td></tr>
<tr><td rowspan="4">Team Members</td><td>Ravi Tej Chaparala</td><td>1230035172</td></tr>
<tr><td>Rishi Kumar Reddy Pebbeti</td><td>1225492021</td></tr>
<tr><td>Jaya Shankar Maddipoti</td><td>1230911684</td></tr>
<tr><td>Pujith Sai Panchumarthi</td><td>1224793427</td></tr>
<tr><td>Project Topic</td><td colspan="2">The project aims to design and implement a Distributed Social Media Platform that leverages distributed database concepts for scalability, fault tolerance, and efficient data management. The platform will include user profiles, posts, comments, and other social interactions. This project is justified by the increasing demand for robust and scalable social media systems that can handle a large user base and ensure reliable performance.</td></tr>
<tr><td rowspan="2">Plan of Action</td><td>Part 1: Design and Implementation of a Distributed Database System</td><td>Tasks:
Schema design for user profiles, posts, comments, and friendships.
We choose PostresSQL for relational database system activities.
Data distribution plan based on user locations or interests.
Efficient data insertion mechanism for real-time updates.
Expected Deliverables:
Distributed Database Schema
Database Tables Creation Scripts
Data Distribution Plan Documentation
Data Insertion Mechanism Code</td></tr>
<tr><td>Part 2: Fragmentation and Replication Techniques</td><td>Tasks:
Horizontal fragmentation for distributing user data based on regions.</td></tr>
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		▪ Vertical fragmentation for optimizing data retrieval based on specific user attributes. ▪ Replication strategies for fault tolerance. **Expected Deliverables:** ▪ Fragmentation and Replication Code/Scripts ▪ Snapshots Demonstrating Fragmentation and Replication
	Part 3: Query Processing and Optimization Techniques	**Tasks**: ▪ Query optimization for efficient retrieval of posts, comments, and friend lists. ▪ Distributed indexing strategies to improve query performance. **Expected Deliverables:** ▪ Query Optimization Code/Scripts ▪ Distributed Indexing Implementation
	Part 4: Distributed Transaction Management	**Tasks:** ▪ ACID-compliant distributed transactions for critical social interactions. ▪ Concurrency control mechanisms for simultaneous transactions. **Expected Deliverables:** ▪ Distributed Transaction Management Code/Scripts ▪ Documentation on ACID Compliance
	Part 5: Distributed NoSQL Database Systems Implementation	**Tasks:** ▪ We choose MongoDB for NoSQL related activities. ▪ Define and document the data schema tailored to social media data needs. ▪ Implement basic CRUD operations for storing and retrieving social interactions. **Expected Deliverables:** ▪ NoSQL Database Implementation Code/Scripts ▪ Data Schema and Model Documentation

	Part 6: 3-Minute Video Demo	**Tasks:** ▪ Script highlighting key components and achievements. ▪ Visual demonstration of the distributed social media platform. ▪ Explain the significance of the project in the context of social media. **Details:** Tools: Premier Pro for Video editing software.
Team Member Contribution/ Responsibility	Ravi Tej Chaparala	Database design, coding, documentation and presentation Main Responsibilities: Design and Implementation of a Distributed Database System
	Rishi Kumar Reddy Pebbeti	Database design, coding, documentation and presentation Main Responsibilities: Fragmentation and Replication Techniques
	Jaya Shankar Maddipoti	Database design, coding, documentation and presentation Main Responsibilities: Query Processing and Optimization Techniques, Distributed Transaction Management
	Pujith Sai Panchumarthi	Database design, coding, documentation and presentation Main Responsibilities: Distributed NoSQL Database Systems Implementation

Signature:

Ravi Tej Chaparala

Rishi Kumar Reddy Pebbeti

Jaya Shankar Maddipoti

Pujith Sai Panchumarthi