**Tutor-Student Matching Database Project**

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**Github Repository:** <https://github.com/vishnurvt/Tutor_Student_Matching>

**I. Introduction**

The Tutor-Student Matching Project is an initiative within the scope of education technology, striving to address the challenges associated with connecting students and tutors effectively. In the contemporary educational landscape, the importance of a refined tutor-student matching process cannot be overstated. This project aims to create an innovative platform where students and tutors can seamlessly connect, fostering an environment conducive to optimized learning experiences.

At its core, the project involves the comprehensive development of an EdTech platform designed to facilitate meaningful connections between students and tutors. Users are provided with the flexibility to register either as students or tutors, each with unique functionalities tailored to their needs and offerings. Central to the project is the implementation of a sophisticated algorithm that takes into account a myriad of parameters to ensure precise tutor-student matching. Upon matching and subsequent registration for classes, the details are stored in a table, offering both parties visibility into the classes they are registered for.

**II. Problem Statement**

The existing tutor-student matching systems are fraught with challenges that impact both students and tutors in distinct ways. Students often find it difficult to locate tutors who align with their specific academic needs, while tutors face challenges in connecting with students whose requirements match their expertise. The inefficiencies within these systems are further exacerbated by a lack of personalized matching criteria and a limited consideration for critical factors such as budget constraints and location-based preferences.

These inefficiencies bear significant consequences, adversely affecting student learning outcomes. The absence of a tailored matching process may impede students' academic progress, creating a gap between their learning needs and the support they receive. However, an improved tutor-student matching system presents the potential for substantial benefits, including enhanced learning experiences for students and increased job satisfaction for tutors through more meaningful engagements.

**III. Project Goals**

The primary objectives of the project include enhancing the efficiency of the tutor-student matching process by implementing a robust algorithm. This algorithm, characterized by its consideration of various parameters such as budget, location, and subject preferences, is poised to create a seamless and personalized experience for both students and tutors. Beyond this, the project aims to improve the overall learning experiences for both parties by ensuring that tutors are matched with students whose needs align with their expertise. Additionally, the project seeks to provide students with a diverse pool of tutors to choose from, thereby expanding their educational opportunities.

To meet the expectations of educational institutions, the project aims to enhance the overall learning support ecosystem. By providing valuable data and insights to institutions, the platform becomes a tool for continuous improvement. Simultaneously, the project strives to address the specific needs of students and tutors through transparent and efficient matchmaking processes. Furthermore, by incorporating feedback mechanisms, the platform ensures continuous refinement based on user experiences. Importantly, the registration table becomes a really helpful feature, allowing both students and tutors to view the classes they are registered for, promoting transparency and accountability within the system.

**IV. ER Model**

A diagram of a computer

Description automatically generated with medium confidence

**V. Implementing the ER Model**

A screen shot of a computer code

Description automatically generated A computer screen shot of a program

Description automatically generated

* Database Management System (DBMS): MySQL served as the primary database management system for the Tutor-Student Matching Database Project. MySQL is an open-source relational database management system that provides a robust and scalable platform for storing and retrieving data.
* Integrated Development Environment (IDE): Python with VS Code – Python, a versatile programming language, was used as the primary language for developing the platform. Its extensive library support and readability made it an ideal choice for implementing the backend functionalities of our EdTech system.
* Chart-Making Tool: Lucid Charts: Lucid Charts, an online diagramming tool, played a crucial role in visualizing and designing the Entity-Relationship (ER) Model for the project. Its user-friendly interface and collaborative features facilitated the creation of a comprehensive ER Diagram, essential for database design.
* Version Control System: GitHub served as the version control repository for the project, hosting the entire codebase. This platform enabled seamless collaboration among team members by providing version tracking, branching, and merging capabilities. GitHub ensured that the development process remained organized and that changes were systematically managed.
* Team Collaboration Platform: Discord served as the central communication hub for the project team. The platform facilitated real-time communication, allowing team members to discuss project-related matters, share updates, and address challenges promptly.

**VI. Design Approach Followed and Challenges Faced**

In terms of design methodology, our initial vision for the Tutor-Student Matching Database Project revolved around the creation of a comprehensive full-stack web application, as conceptualized during Phase 1. However, confronted with tightening deadlines and limited expertise in front-end development, an eventual pivot led us to prioritize a robust platform through a strong backend. This shift allowed us to maintain focus on core functionalities while navigating the challenges presented by time constraints and the evolving skill set of our team members while tackling the project’s problem statement and tight deadlines.

Throughout the ER modeling phase, challenges emerged as we worked together to translate dynamic project requirements into a cohesive database structure. Defining relationships, entities, and constraints proved to be intricate tasks given the project's evolving nature. To overcome these challenges, our team engaged in extensive collaborative discussions and utilized online tools such as Lucid Charts for visual representation. Regular meetings were conducted to foster a shared understanding of the evolving database design, leading to iterative improvements.

**VII. Future Scope of the Project**

Looking ahead, the future scope of the project is marked by meaningful expansion and software updates. Additional features are on the horizon, intending to elevate the tutor-student matching system. These features may encompass advanced filtering options, personalized recommendations based on past matches, and refined algorithms for more precise pairing. Exploring integration possibilities with other educational systems is also a key avenue for broadening the platform's reach. Collaboration with learning management systems or educational databases would enhance the matching algorithm, providing a more comprehensive educational support ecosystem.

In terms of software updates, the project hopes to continuously improve system efficiency and user experience. Machine learning algorithms for smarter matching, real-time data analytics, and enhanced security measures would be some key courses of action for our development team. A continuous improvement model, marked by regular updates, will be adopted. This iterative development approach will incorporate user feedback, addressing evolving educational needs. A dedicated focus on customer support features is integral to ensuring a responsive and user-friendly platform. Regular engagement with users and the incorporation of their feedback will be pivotal in continuously refining the algorithm.

**VIII. References** **and** **Bibliography**

1. <https://www.w3schools.com/sql/>
2. **Database System Concepts textbook and slides**

**IX. Contributions**

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| **Team Member Name** | **Contributions** |
| Ivan Tejeda | Wrote Backend Code - Python and SQL files  Inserted Data  Helped create Relational Schema and ER Model  Created Demo Video  (Project Phases 1, 2 and 3) |
| Vishnu Thampuran | Helped with Backend Development,  Helped create ER Model,  Wrote Project Report,  Wrote Github Documentation  (Project Phases 1, 2 and 3) |
| Elijah Simkin | Helped with ER Model, Relational Schema for phase 2  (Project Phase 1 and 2) |