Proposal for Orbital 24

Team Name:
TutorConnect

Member Name:
1. Lo Yong Zhe A0272179W
2. Low Tse Wei, Ethan A0272527B

Proposed Level of Achievement:

Apollo 11

Motivation

As the demand for personalised education and academic support continues to rise, driven by diverse learning paces, intricate subjects, and unique academic objectives, a pressing challenge emerges in finding suitable tutors amidst limited availability and the difficulty of assessing tutor credibility. To address these obstacles, technological advancements offer a promising solution through the creation of a centralized platform. This platform connects students and parents with qualified tutors tailored to individual needs, preferences, and academic goals. By leveraging technology, this initiative enhances the overall learning experience while fostering a collaborative educational community, empowering learners to achieve their full potential.

Aims

We hope to:

- Provide a centralized platform for students and parents to easily find qualified tutors based on their individual needs and preferences.
- Streamline the tutor-student matching process by leveraging personalized matching algorithms and communication tools.
- Enhance the overall learning experience by fostering collaboration, accountability, and support within the educational community.

User Stories

[Please describe what the users would be able to do with your system.]

- As a student who wants to find the perfect tutor for my academic needs, I want to be able to create a detailed profile outlining my preferences and requirements.

- As a student who is looking for a tutor, I want to be able to search and browse through a diverse pool of tutors based on various criteria such as subject expertise, availability, and ratings.

- As a student who wants personalized matchmaking, I want to be able to utilize advanced algorithms to facilitate optimal matches with tutors who align with my unique needs and goals (if got time).

- For both students and tutors who want seamless communication, an integrated messaging system can be implemented to discuss tutoring arrangements, schedule sessions, and clarify any questions or concerns.

- Students are given the option to provide feedback on their tutors, either via rating them based on the number of stars or via comments. If comments were given, we can perform sentimental analysis to gauge the ratings of the tutor (if got time). This helps to maintain the quality of tutoring services and inform other users' decisions, ensuring transparency and accountability.

- Secure payment options for paying of one-time matchmaking fee. Shopee Paynow system.

- As a member of the tutoring community who seeks engagement and support, I want to be able to participate in forums or discussion boards where users can engage in knowledge sharing, ask questions, and offer support to one another.

Features

Feature 1: User Profiles

Allow users (both students and tutors) to create detailed profiles with information such as qualifications, expertise, availability, and teaching style.

Feature 2: Searching and Matchmaking

Implement search functionality for users to browse and filter tutors based on criteria such as subject expertise, availability, and ratings. Develop matchmaking algorithms for personalized tutor-student matches, may consider using reinforcement learning machine learning model to best match the tutor and students.

Feature 3: Communication Tools

Integrate messaging system to facilitate seamless communication between students and tutors for discussing tutoring arrangements, scheduling sessions, and addressing queries.

Feature 4: Feedback and Reviews
Develop a feedback and review system where users can provide ratings and reviews after each tutoring session, enhancing transparency and accountability within the community.

Feature 5: Payment
Integrate secure payment options for one-time matchmaking fee.

Feature 6: Community Engagement
Create forums or discussion boards where users can engage in knowledge sharing, ask questions, and offer support to one another, fostering a vibrant and collaborative learning community.
Report system so that users are able to report inappropriate or abusive messages.

Timeline
Milestone 1 (3 June) - Technical Proof of Concept:

- Feature 1 (Core): User Profiles implemented with basic functionality.
- Backend and frontend integration for user registration and profile creation.
- Students should be able to post assignments and tutors are able to apply for assignments.
- Website with basic functionality.
- Technical feasibility of communication between users established.
- Timeline: 3 weeks

Milestone 2 (1 July) - Prototype:

- Feature 2 (Core): Search and Matchmaking fully implemented with basic filtering functionality.
- Feature 3 (Core): Communication Tools integrated with messaging system for basic communication between users.
- Basic user interface design for core features implemented.
- Backend and frontend integration for core features completed.
- Timeline: 4 weeks

Milestone 3 (29 July) - Extended System:

- Feature 4 (Extension): Feedback and Reviews system implemented with basic rating functionality.
- Feature 5 (Extension): Payment system integrated with payment options.

- Feature 6 (Extension): Community Engagement features developed, including forums or discussion boards (system can be something like r/homeworkhelp).
- User interface design refined and enhanced for extended features.
- Backend and frontend integration for extended features finalized.
- Timeline: 4 weeks

Total Time: 13 weeks (3 months)

Tech Stack

1. Docker (Container)
2. NextJS/ MERN (Full Stack Web app with TypeScript)
3. Prisma (Databases)
4. PostgresSQL (Databases)
5. Github Actions (Devops)
6. Miro (Digital Ethics and Data Privacy)
7. Azure (Cloud)

Qualifications

Low Tse Wei, Ethan

- Programming Languages: Java, JavaScript, Python
- Other stuff: SQL, PowerBI and ReactJS

Lo Yong Zhe

- Programming languages: Python, Java and Javascript
- Frameworks: Mongodb, ReactJS, ExpressJS, NodeJS, NextJS, PostgresSQL, RubyonRails, Scikitlearn, Tensorflow
- Github: https://github.com/Reallyeasy1
- Created a real time AI auto transcript tool regularly interacting with OpenAI's Whisper API, allowing conversations to be transcribed without any human help.
- Developed a LSTM model trained on time series data to predict future stock prices of Nvidia
- Trained a NLP model to conduct sentimental analysis on sentences
- Worked on Quantify project by developing innovative ML trading models (ARIMA, SARIMA, GARCH) using Yahoo Finance datasets as well as integrating sentiment classifiers on stock market news to enhance insights, focusing on a subset of large companies including Apple and Netflix.

Software Engineering

Our team's adoption of Agile methodologies, facilitated by tools like Miro, ensures that we can adapt to changing requirements and feedback throughout the development process, facilitating continuous improvement and alignment with user needs. Regular user feedback sessions will allow us to gather insights and iterate on features, ensuring that our platform remains relevant and valuable.

Test-Driven Development (TDD) will be integral to our process, as it helps us identify and address issues early in the development lifecycle, resulting in higher-quality code and faster delivery of features. Leveraging version control with Git enables seamless collaboration among team members, allowing for concurrent development and easy tracking of changes.

Additionally, embracing GitOps practices streamlines our development workflow, enabling automated deployment and infrastructure management. Continuous integration (CI) tools will automate testing processes, enabling rapid feedback loops and ensuring that new code integrates smoothly with the existing codebase.

Our focus on scalable backend architecture will ensure that our platform can handle growing user demand and evolving requirements without sacrificing performance or stability. Additionally, by employing machine learning techniques for personalized matchmaking, we can enhance user experience by providing tailored recommendations based on individual preferences and learning styles.

Secure communication with end-to-end encryption and integration with PCI-compliant payment gateways will safeguard user data and financial transactions, building trust and confidence in our platform. Throughout our development process, we adhere to SOLID principles to foster maintainable and extensible code, ensuring that our software remains robust and easy to modify as it evolves. DevOps principles are integrated throughout our pipeline, enabling seamless collaboration between development, operations, and quality assurance teams.

Continuous integration and continuous deployment (CI/CD) practices are key components of our workflow, allowing for automated testing, rapid feedback cycles, and streamlined deployment processes. Through the application of these methodologies and principles, we aim to deliver a reliable, user-friendly platform that prioritizes scalability, security, and maintainability, while remaining responsive to the needs of our users.