Trivia AI Adventure

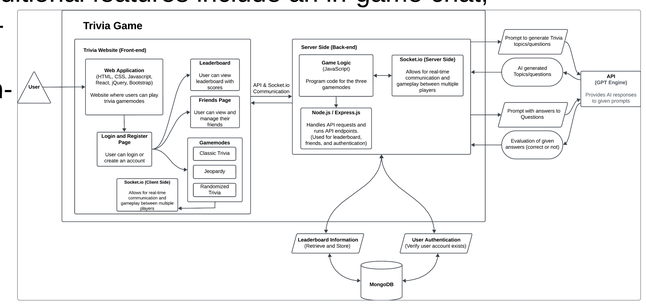
Omar Alkadry, Moataz Hikal, Paul Jablonowski, and Matthew Nobleza

Problem Statement

Trivia games have always been an enjoyable pastime in many groups. One of the many issues they suffer from is limited question banks and repetitive content. AI has been everywhere for the past couple years and we have seen people begin applications in games where they are trying to do the same with quests. AI can generate infinite quests that are also catered to the kind of quests each player prefers. Hopefully the project would increase awareness for AI applications in video games.

Solution

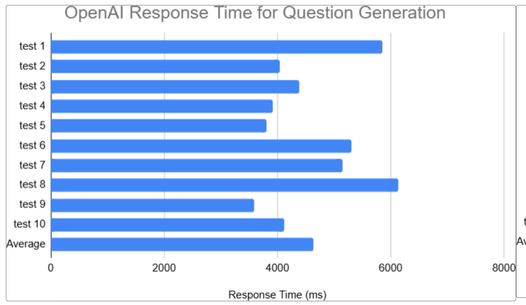
By integrating AI into the content generation, this project aims to provide a trivia experience with endless challenging content and also personalized topics to each group of players. The AI will ensure a diverse and endless array of questions and topics to keep players engaged long term. We developed a real-time multiplayer trivia game that leverages the usage of the OpenAI GPT-4 engine for dynamic question generation and personalized topic creation. The game will include 3 modes, Classic Trivia, Trivia Board, and Random Trivia. Additional features include an in-game chat, leaderboard and score-board which can save score history, user auth-entication, and game room settings.

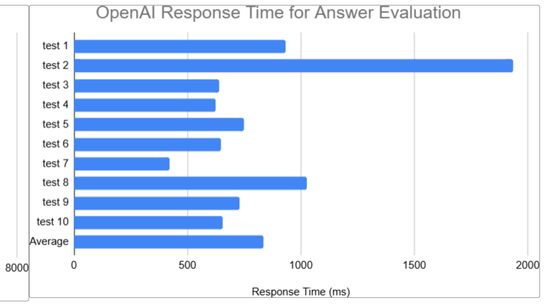


Literature Review

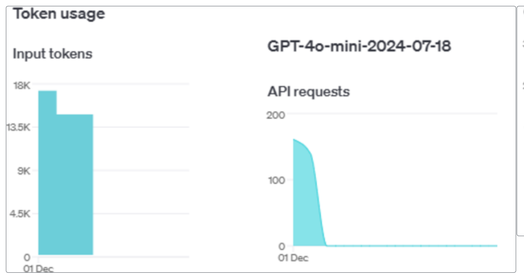
Trivia games provide entertainment and fun, but they can also have a positive effect on student's learning in school and other target audiences. A literature review study found that "Kahoot! can have a positive effect on learning performance, classroom dynamics, students' and teachers' attitudes, and students' anxiety" (Wang and Tahir, 2020). This can translate to our proposed AI-focused trivia game when used in a classroom setting. In addition, the results of one study had improvements in the overall scores from prior test and post-test due to increased motivation and engagement from the students through game-based learning, such as trivia games (Jackson and Zakti, 2023). A different study found improvements in engagement using trivia with the robot Tangy, and increased collaboration with teammates through team-based games with other senior citizens (Thompson et al., 2017). Hence, trivia games have resulted benefits for group in the studies, where for students, it's improvements in aspects of learning, and for seniors, it's increased engagement with surrounding people.

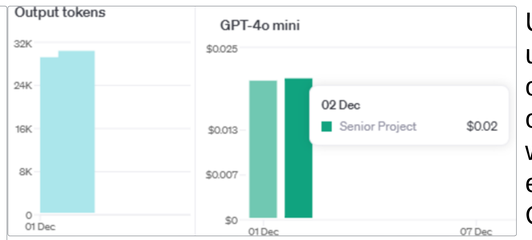
Results





OpenAI API prompt configured to have a total of five questions per test and a 'General Knowledge' explicitly declared generated questions and content. Hence, initial AI-generation of questions content is significantly greater latency compared to AI-evaluation for answers. Although large variances between each test.





Usage metrics from OpenAI for the usage of GPT 4o mini. For perspective other comparisons were done with other OpenAI engines like GPT 4 which one day of testing equaled an entire month's worth of testing on the GPT 4o mini (rough estimate). The difference in performance was not discernible.

Data & GUI

Conclusion

In this project, three different game modes were implemented that use dynamic question generation with AI. The first was with a simple implementation of AI generated content. The other two build upon the first with distinct differences and advancements. Trivia Board shows varied difficulty in generated questions using AI. Random Trivia shows that AI is capable of assessing free response answers for correctness. Also, a real-time room-based multiplayer system was created with synchronized game states for all users.

References

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