DOKUZ EYLÜL UNIVERSITY
ENGINEERING FACULTY
DEPARTMENT OF COMPUTER ENGINEERING

CME 3401
Database Management Systems

WEB BASED WORD GAME (WORDHOUSE)

by
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PROJECT PROPOSAL

ABSTRACT

This project aims to develop a competitive, web-based game where two players challenge each other in a series of real-time, turn-based prompts. The game presents questions such as "names that start with A" or "countries in Europe," and players must take turns providing valid answers within a set time limit. The objective is to encourage quick thinking and knowledge recall, as players must avoid repeating responses or running out of time. This interactive, browser-based application combines a dynamic user interface with real-time validation and score tracking, providing an engaging experience for players while testing their creativity and mental agility.

INTRODUCTION

This project proposal outlines the development of a web-based, multiplayer game designed to engage two players in a quick-thinking, knowledge-based competition. The game presents players with prompts such as “names that start with A” or “animals found in Asia,” challenging them to respond with valid answers in turn within a set time limit. This project is not only interesting due to its fast-paced, interactive nature but also important in its potential to enhance players' recall and creative thinking skills. By implementing this application, we aim to create a dynamic and enjoyable platform for players to test their knowledge and quick-wittedness in a casual yet competitive environment. With a focus on simplicity and user engagement, the game leverages real-time responsiveness, ensuring that players experience seamless and immersive gameplay. This proposal will outline the features, purpose, and implementation approach that will make this game both compelling and rewarding for its users.

PURPOSE AND BENEFITS

The purpose of this application is to offer a fun and interactive platform where players can challenge each other's knowledge in a competitive, turn-based format. The game's main appeal lies in its ability to test users' creativity and memory under pressure, requiring them to come up with unique answers quickly. This type of gameplay encourages mental agility and can be a valuable tool for enhancing cognitive recall and thinking speed.

Users would be drawn to pay for this application because of its addictive, real-time challenges and replayability. Potential benefits include stress relief, entertainment, and social connection through friendly competition. Premium features, such as personalized categories, score tracking, and exclusive game modes, could further enhance user engagement, making it a worthwhile investment for players seeking a unique mix of enjoyment and cognitive training.

MODE, MEDIUM, AND ENVIRONMENT

This web-based game is designed for online environments, accessible from both desktop and mobile browsers. We assume players will engage with the game from various locations—such as home, school, or on the go—provided they have reliable internet access. The game mode is turn-based and requires real-time interaction, as players must alternate responses within a set time limit. This requires a low-latency, responsive design to ensure smooth gameplay and quick feedback for each player's turn.

The design process must account for these assumptions by focusing on compatibility and responsiveness across devices. Additionally, the application needs efficient server-side processing to handle real-time requests and validation, ensuring that each player's response is immediately verified and that turn transitions are seamless. To provide an optimal experience, the design will prioritize user-friendly navigation, visual clarity, and minimized loading times, supporting smooth gameplay in various network conditions and environments.

FUNCTIONALITY

The application will include the following core functions:

1. **User Authentication**: Players can create accounts, log in, and log out to access the game. This feature includes secure password management and optional social media login.
2. **Game Lobby**: A waiting area where users can see available games, start a new match, or invite friends to play. Players are matched in pairs for each round of competition.
3. **Real-Time Question Prompts**: The game will display a prompt, such as "names that start with B," and assign a timer for each player's response. Prompts will be randomly selected from a pre-defined set of categories.
4. **Turn-Based Gameplay**: Players take turns responding to the prompt. Each turn is timed, and failure to respond within the time limit results in losing the round.
5. **Answer Validation**: The application will verify each response to ensure it meets the criteria (e.g., correct starting letter, relevant category). Duplicate or invalid answers will be flagged.
6. **Score Tracking**: Points will be awarded for each valid response, and scores will be tracked in real-time. A leaderboard may also be included to display top scores over time or by session.
7. **Game End and Results Display**: At the end of each game, the final scores are displayed along with the winner. Players can choose to rematch or return to the lobby.
8. **Responsive Design**: The application will be accessible on both desktop and mobile devices, with a user-friendly interface that adjusts based on screen size.
9. **Optional Features (for Future Expansion)**:
    - **Personalized Categories**: Users could select categories of interest, allowing for customized gameplay.
    - **Chat Functionality**: A basic in-game chat for players to interact.
    - **Achievements and Rewards**: Special badges or rewards for high scores or winning streaks.

Each of these functions contributes to an engaging user experience, fostering competitive and enjoyable gameplay while emphasizing ease of use and accessibility.

HIGH LEVEL ORGANIZATION

The application's high-level organization is designed to provide an intuitive, efficient user experience with minimal navigation steps. Below is a functional decomposition and hierarchy outlining the main components:

1. **Landing Page**
    - **Purpose**: Welcomes the user and provides an overview of the game.
    - **Features**: Brief introduction, "Login" and "Sign Up" options, and links to learn more about the game's rules and features.
2. **Authentication System**
    - **Login/Sign Up**: Users can create an account or log in to access the game.
    - **Account Management**: Allows users to reset their passwords, update profile details, and log out.
3. **Main Menu / Game Lobby**
    - **Purpose**: Central hub where users can start a game, invite friends, or join a random match.
    - **Options**:
        - **Start New Game**: Opens a matchmaking process to pair the user with an opponent.
        - **Invite Friends**: Allows the user to send a game invitation to a friend.
        - **View Leaderboard**: Accesses a leaderboard showcasing top players.
4. **Game Room**
    - **Real-Time Gameplay**: Once paired with an opponent, both players enter the game room, where they take turns answering prompts.
    - **Components**:
        - **Prompt Display**: Shows the current question or category.
        - **Timer**: Displays the time remaining for each player's turn.
        - **Answer Input**: Input field where players enter their responses.
        - **Scoreboard**: Real-time scoring panel tracking each player's score.
5. **Answer Validation and Scoring**
    - **Automated Verification**: Checks each submitted answer for validity according to the prompt.
    - **Score Calculation**: Awards points for correct answers and updates the scoreboard instantly.
6. **Game End and Results Screen**
    - **Final Results**: Displays the final scores and winner at the end of each game.
    - **Options**:
        - **Rematch**: Players can start a new game with the same opponent.
        - **Return to Lobby**: Returns players to the Game Lobby to start a new game or find another opponent.
7. **Optional Features**
    - **Chat System**: Enables players to chat with each other during the game.
    - **User Profile and Statistics**: Allows users to view their game history, performance statistics, and achievements.

This initial design ensures a seamless user flow, with logical progression from authentication to gameplay. Each component is modular, supporting future scalability and maintenance while keeping the interface clear and easy to navigate.

FUNCTIONALITY VS POLISH

In developing this application, the majority of time—approximately 70%—will be allocated to building core functionality. This includes setting up the authentication system, developing the game lobby, implementing real-time, turn-based gameplay, handling answer validation, and scoring. This initial development phase focuses on ensuring the application's essential features are robust, efficient, and bug-free to provide a smooth user experience.

The remaining 30% of the time will be dedicated to polishing the application, which involves refining the user interface, enhancing responsiveness across devices, and improving visual aesthetics for a more engaging experience. This stage will also cover optimizing transitions, animations, and layout adjustments to make the application more visually appealing and user-friendly. Polish work will help create an immersive and professional feel that complements the core functionality, making the application enjoyable and intuitive for users.

MILESTONES AND TIMELINE

With two team members, tasks can be distributed to enhance efficiency and collaboration. Below is the adjusted timeline with role assignments for each week. **Developer 1** and **Developer 2** are placeholders for each team member.

3.1.1.1. Week 1: Project Setup and Planning

- **Milestones**:
  - **Both Developers**: Define detailed project requirements, scope, and assign specific tasks.
  - **Developer 1**: Set up the development environment and version control (e.g., Git).
  - **Developer 2**: Outline the database schema and create the ER diagram.
  - **Both Developers**: Collaborate on initial UI wireframes and layout mockups.

3.1.1.2. Week 2: Database and Backend Development

- **Milestones**:
  - **Developer 1**: Install and configure MySQL, design and implement the database schema.
  - **Developer 2**: Set up basic RESTful API endpoints using Node.js and Express.js.
  - **Both Developers**: Implement user authentication (sign up, login, logout) and test API connections.

3.1.1.3. Week 3: Core Game Mechanics

- **Milestones**:
  - **Developer 1**: Develop the game lobby and implement real-time question prompts.
  - **Developer 2**: Create turn-based gameplay mechanics, answer validation, and scoring functionality.
  - **Both Developers**: Test core game features in a local environment and adjust as needed.

3.1.1.4. Week 4: Frontend Development

- **Milestones**:
  - **Developer 1**: Develop frontend components (HTML, CSS, Bootstrap) with a focus on responsive design.
  - **Developer 2**: Integrate JavaScript functionality for dynamic interaction with API endpoints.
  - **Both Developers**: Conduct initial frontend-backend integration tests.

3.1.1.5. Week 5: Real-Time Communication and Final Game Features

- **Milestones**:
    - **Developer 1**: Implement real-time turn-based gameplay (e.g., with WebSocket).
    - **Developer 2**: Finalize scoring, answer validation, and game-end functionalities.
    - **Both Developers**: Add optional features, such as leaderboard and chat functionality.

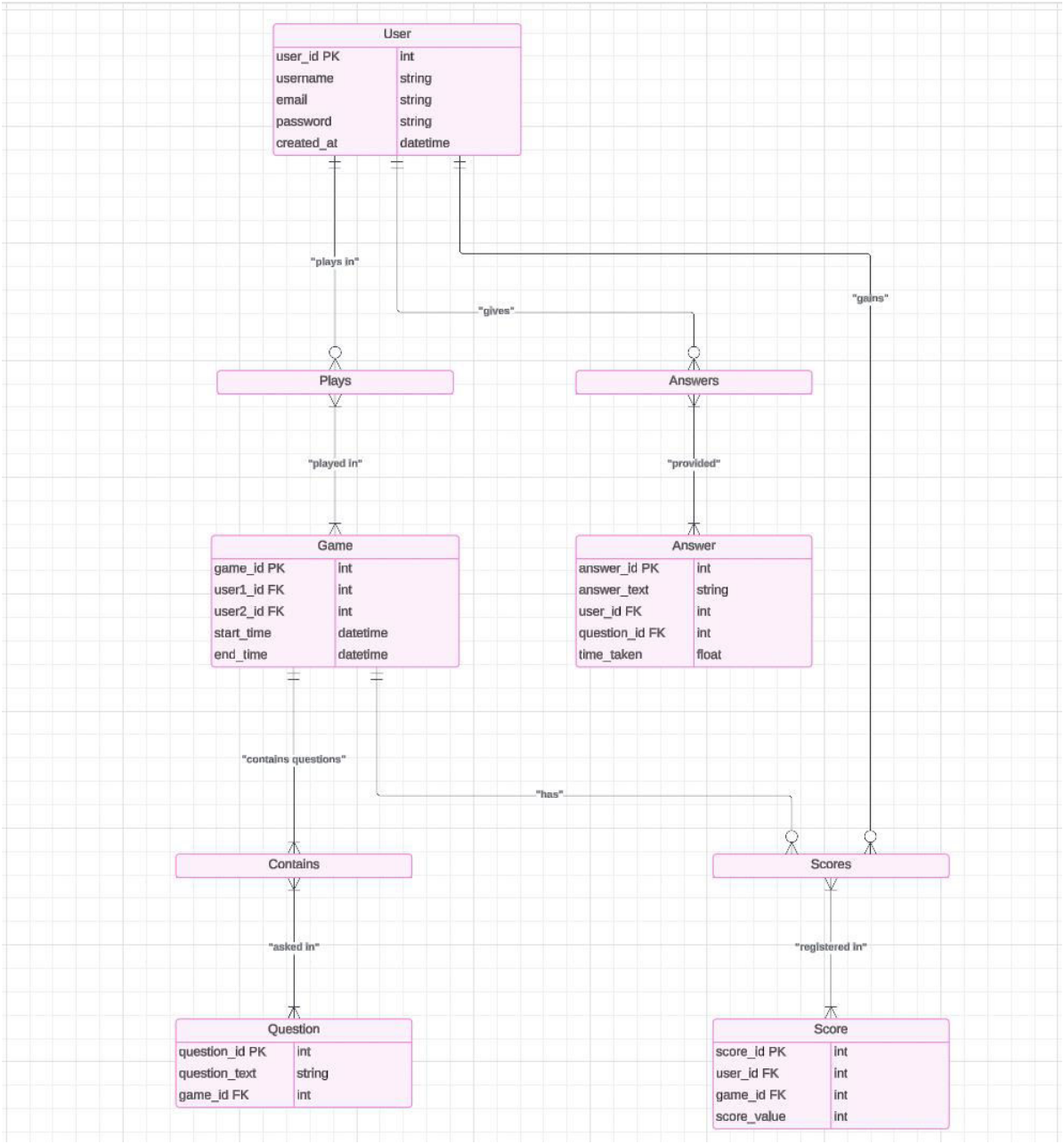
3.1.1.6. Week 6: UI Polish and User Testing

- **Milestones**:
    - **Developer 1**: Refine the user interface with styling improvements, animations, and transitions.
    - **Developer 2**: Optimize application performance and conduct loading time improvements.
    - **Both Developers**: Conduct user testing and adjust based on feedback.

3.1.1.7. Week 7: Final Adjustments and Deployment

- **Milestones**:
    - **Developer 1**: Prepare the application for deployment, set up server, and configure environment variables.
    - **Developer 2**: Verify final functionality, test in a live environment, and troubleshoot any deployment issues.
    - **Both Developers**: Finalize documentation and ensure all features are functioning as expected post-deployment.

This collaborative timeline allows each developer to focus on complementary tasks and maintain consistent progress, ensuring that the project is completed on time with high quality.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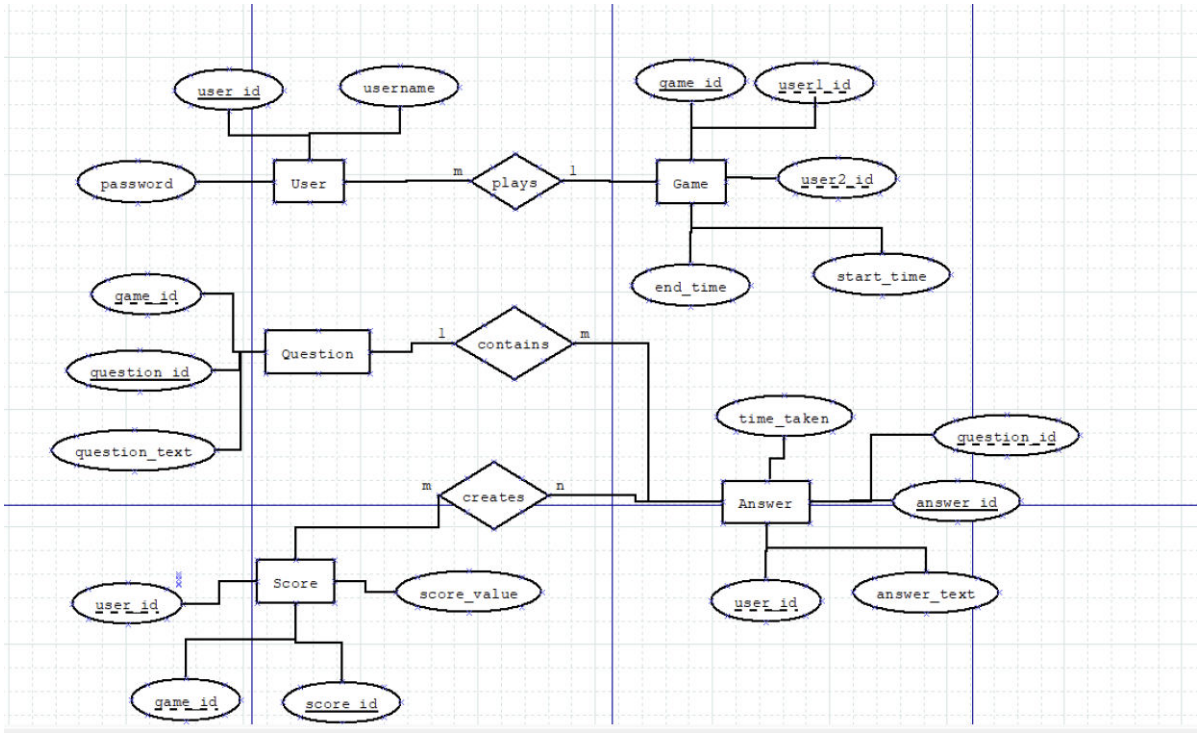
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