**Project Report (Palindrome Game)**

**Game Concept**

The Palindrome Game is a challenging and engaging word game that tests players' vocabulary, problem-solving skills, and speed. It offers two distinct game modes:

1. **Scrambled Palindrome:** Players are presented with a scrambled set of letters. They must rearrange these letters to form a valid palindrome word.
2. **Unique Palindrome:** Players are given a word and must create unique palindromes by modifying a single letter at a time.

**Core Features**

**Game Engine**

* **Word Generation:**
  + A database of palindromes is maintained in a file.
  + Words are randomly selected based on the current level's difficulty.
  + For the Scrambled Palindrome mode, words are randomly shuffled.
* **Palindrome Checking:**
  + A recursive function is used to efficiently check if a word is a palindrome.
  + The function iterates through the word, comparing characters from both ends.
* **Scoring System:**
  + Players earn points for each correct answer.
  + Points are awarded based on the difficulty of the word and the time taken to solve it.
  + A time penalty is imposed for incorrect attempts or exceeding the time limit.
* **Level Progression:**
  + As the game progresses, the difficulty level increases.
  + This can be achieved by increasing the word length, complexity, or time limit.
  + The game ends when the player reaches a certain level or fails three consecutive attempts.

**User Interface**

* **Menu System:**
  + A clear and intuitive menu allows players to select game mode, view high scores, and access settings.
  + A switch-case statement is used to handle different menu options.
* **Game Screen:**
  + Displays the current word or scrambled letters.
  + Provides a text box for player input.
  + Shows the timer, score, and number of attempts remaining.
* **Feedback Mechanism:**
  + Provides immediate feedback on the player's input, whether it's correct or incorrect.
  + Displays error messages for invalid input.
  + Offers hints or clues for challenging words.

**Data Management**

* **Word Database:**
  + A text file stores the list of palindromes, organized by difficulty level.
  + Dynamic memory allocation is used to load words from the file into memory.
* **Player Progress:**
  + Player scores and progress are stored in a file.
  + This allows players to track their performance and compete with others.

**Additional Features**

* **Time Limits:**
  + Each level has a specific time limit.
  + A timer is displayed on the screen to keep track of remaining time.
  + Time penalties are applied for incorrect answers or exceeding the time limit.
* **Power-ups:**
  + Power-ups can be earned or purchased to enhance gameplay.
  + Examples of power-ups include:
    - Extra time
    - Hint
    - Shuffle letters
* **Multiplayer Mode:**
  + Players can compete against each other in real-time or asynchronously.
  + A leaderboard displays the top scores.
* **Customization:**
  + Players can customize the game's appearance, sound effects, and difficulty level.

By incorporating these features, the Palindrome Game can provide a challenging and enjoyable experience for players of all ages.

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