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PROJECT REPORT

Topic: Skip List

Subject: Data Structures and Algorithms

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1. Overview

- The file **main.py** implements a Wordle-style word guessing game using Python's Tkinter GUI library
- Players try to guess a hidden word of a chosen length, and the system provides visual feedback.

2. Main structure

- Main class: `GameApp(tk.Tk)`
 - o The class inherits from `tk.Tk` and manages all screens (start, game, end) and the main game loop

3. Interface screen

3.1. Start screen:

- Display title and subtitle
- Load word length options from a text file (`word_lengths.txt`)
- Allow players to select word length using a Listbox and press ENTER to start.

3.2. Game screen:

- Contain 2 main sections:
 - o Grid area: Letters are displayed in rows and columns.
 - o Virtual keyboard: Includes A-Z letters, Enter, Backspace, and Home buttons.

3.3. End screen:

- 2 display modes:
 - o Win screen
 - o Lost screen
- Show the correct word
- 3 buttons:
 - o Play again
 - o Home
 - o Exit

4. Game logic

4.1. Word loading and caching:

- Words are loaded from files under the “words/” directory (e.g., wordle-5.txt)
- Caching improves performance

4.2. Game initialization:

- A random secret word is selected
- Grid and keyboard states are reset

4.3. Input handling:

- Supports both physical keyboard and on-screen keyboard
- on_key_press(): Inserts letters
- on_backspace(): Deletes the last letter
- process_guess(): Evaluates entered word

4.4. Guess evaluation:

- Each guessed letter is compared with the secret word:
 - o Green: Correct letter and correct position
 - o Yellow: Correct letter but wrong position
 - o Gray: Letter not in the secret word
- Both the grid and keyboard update accordingly

4.5. Win/Loss conditions:

- If the player guesses the correct word: Win screen appears
- If all guesses are used: Lose screen appears

5. Additional features

- Toast-style error notifications (red background) for invalid inputs
- Word list caching for efficiency