APTOS: Blockchain Challenge

PS-3: On-chain Implementation of Wordle and Qwordle

Team 35

Our Product

- We have implemented **Wordle and Qwordle completely on-chain** on the Aptos blockchain using Move modules.
- Qwordle offers a fun and engaging gaming experience, making it an ideal platform for introducing new users to blockchain interactions in a seamless manner
- The Qwordle dapp efficiently handles a large transaction volume, showcasing the high throughput of the underlying blockchain technology.
- This app can be an interesting first dapp to introduce new users to Aptos, as it demonstrates to users the speed and ease of use of Aptos, while simultaneously providing an engaging way to interact with the blockchain.
- Answers for the qwordle are all Aptos/blockchain related keywords.

Key Features

- Users can visit our website which integrates Petra Wallet for communicating with the Aptos blockchain.
- Users can play on desktop using the Petra Wallet browser extension, or on mobile using the Petra app's built in browser.
- Users can easily track their progress, as the dapp displays statistics such as the total number of games played, games won, and their current winning streak.

Implementation

- We have implemented three modules:
  - **addr::wordle** and **addr::qwordle** respectively provide the implementations of wordle and qwordle
  - **wordle_common** provides common subroutines, such as checking whether a guess is a valid word, or generating random numbers to choose the next secret word.
- One significant detail is that the list of valid words is stored as a vector, where each word is encoded as a u32. This is to compress the wordlist, as we were hitting the maximum package size limit of the blockchain.
- For qwordle, the list of pairs of words is hardcoded into the module, to allow for quickly choosing the word pair.
- There are three entry functions: *register*, *submit_guess*, and *reset*, and two view functions: *get_stats* and *get_game_state*

Implementation

- Users are allowed to play an unlimited number of games, instead of limiting them to one game per day like standard wordle does.
- Website
  - The website is implemented using React.js and Material UI.
  - It integrates with Petra wallet to get the user's address and to sign and submit transactions
  - It uses the Aptos TypeScript SDK to interact with the blockchain and to access the view functions.
  - It also provides a timer showing the time taken on the current problem.

Future scope

- A competitive mode, where users compete to solve the same word at the same time.
- Leaderboard showcasing users who have solved the most wordles in the fewest guesses.
- A feature so that (Q)Wordle results can be shared and flaunted with friends, enabling a large online presence.