

## Mini-Project: Proposal

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For my project, I will create an ai agent that can play the popular online game, Wordle. Wordle is a game hosted by the New York Times where one must guess a five-letter word within 6 guesses. If a guessed letter is correct and in the right spot, it is shown with a green color, whereas if a guessed letter is in the word but is in the wrong spot, it is shown with a yellow color. There are some strategies to minimizing the amount of user guesses, such as entering words with common letters (like t or s) as well as entering words with a bunch of vowels (like "Ocean"), as this can help the player narrow down the number of possible words. For some people, however, this may not be enough to find the correct choice, and the failure to pick the correct word after six tries results in a treasured winning streak breaking. The people who would potentially use this application would likely be daily users of wordle who, if in a tight spot, would rather use this application to come up with the correct solution than simply google the correct answer. In addition, such a tool could potentially be used as practice.

The following is a use case for this "AI Wordle Application": Steven is a relatively new Wordle player. He has been playing this game for about 2 weeks now, and he has a 10-game winning streak. So far, he has made two guesses, yet he has been unable to get any correct letters confirmed (yellow or green) so far. Unwilling to simply google the correct answer or let his streak end, he finds the AI Wordle Application online and enters in his previous two guesses. Based on this information, the application then lists the top 10 answers in order of likelihood, with the percentage chance of them being correct displayed. Steven answers the first potential answer, which is wrong. He then enters this answer into the application, which then allows it to eliminate thousands of potential answers, with the new most likely answer being rated as 80% likely to be correct. Steven enters this answer as his fourth guess, and it turns out to be correct, ensuring that Steven's streak continues.

This project would fall under the "Game" category of AI. In order to create this application, various tasks will need to be carried out. First, the list of valid Wordle solutions, which consists of 2,315 possible words, will need to be obtained, as well as a list of valid Wordle guesses, which consists of 10,657 words. Second, an algorithm would need to be developed to have the application come up with the list of best possible word choices. Such an algorithm will need to be able to eliminate words that can't possibly be a solution, as well as be iterative in nature, such that it captures information from past guesses. Ideally, the algorithm is able to maximize the amount of correct letter guesses after one guess and is able to utilize this information to correctly guess the answer in less than 4 attempts. Finally, though this may be a luxury and not entirely necessary, a GUI should be developed so that this project isn't entirely text/console based, where the user is able to enter words to guess and grade the algorithm on its accuracy (if letters are correct and/or in the right space). The final application should be able to guess random words and display performance as well as guess words entered by the user. The goal is to program this project using Python, enforce version control via git, and have a workable demo ready for the project presentation.