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Principles of Programming Languages

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Project 2 Writeup

To run the program, one must input a five-letter word followed by the five number designation of the correctness of the letters and their positions (i.e. “abcde12345”). The terminal will have a blank line at which one enters their prompt. You must also separate guesses with a comma and a space. Thus, the project runs very similarly to the first. Additionally, list data structures are used to track certain characters, positions, collected potential words, and the list of overall words that is examined for matches. Generally, I chose to iterate over a list, generating appropriate lists to represent characters in guesses, and going though the guess list and query list to see what things matched. Also, I used a hash table to track the number of times a word appeared in the potential word list, using the highest intersections to list the ones that should be displayed at the end. In this sense, this implementation of the project is very similar to the first.

The basics of the algorithm I use are also very similar to the first. In each guess, I generate a list of characters associated with zeroes, ones, and twos, and the positions for the subsequent two. Then, I iterate through the file, checking each word to see if it fits, and disregarding it otherwise. Then, I take that list and add every element to a hash table, tracking occurrences. If its occurrences are equal to the number of overall guesses in the user input, then I print this result as a potential correct word. Advantages of the solution in ML include structurally easier to understand code than Java as each function must be written in a certain manner in order for things to work successfully. Strict types and other elements of the language ensured program integrity in a codified manner. Disadvantages included the lack common looping syntax, like for, while, do while, or until loops. As such, I handled everything recursively, which can be time-consuming for simpler functions wherein I would easily see a way to execute it. Another difficulty I had to handle was nesting two loops, as I looped through the guess list and the entire potential word list on each guess. I separated each loop into different functions to make it easier to implement. A final disadvantage was difficult installation and spotty support of the language on VScode and other IDEs; however, I noted that this was often discussed positively in the documentation I read to install everything I needed. Overall, ML has some notable advantages and disadvantages, and it can be implemented without too much time cost on the part of the user.