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# Design

**The Project:**

The Rap Battle Bot interacts with the user to create a rap battle experience, in which the program processes a user inputted audio and generates a response rap verse in response. First, the user speaks to the program. Then, the audio is processed through the Python Speech Recognition module and converted into a text. By selecting random keywords within the user inputted speech and comparing these keywords to a database of existing rap song lyrics, it generates the response.

**The Algorithm:**

The program uses the concept of Markov Chains to write a speech prediction algorithm. Using a database of text, (in this case, a compilation of existing rap songs in the English language,) it creates a dictionary mapping each word to a dictionary of words that come sequentially after it, as well as the number of times each pair of words is used together. Because the program generates rap verses by rhyme, it processes through the database of text backwards, creating a dictionary that maps each word to the word before it, and the number of times this occurs. After processing through all the text, a separate dictionary is created, keeping track of the probability that one word comes sequentially before another. Finally, when asked to generate a verse given an ending word to rhyme with, the algorithm builds each verse backwards, starting

the last word in each line.

**User Interface**

The user interface is intentionally simple, providing clear instructions on how to user the program on each screen. With every button is an explanation of what it is used for. Also, the flow of screens in the program is pretty straightforward. It generally moves from the recording screen, to a processing screen, to the response screen, with an option to start over at the end. This way, there is no confusion on what sequential order the program is supposed to be used. Also, the work needed to be done by the user is very minimal.