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Lab 4: N-Grams and Spell Check

Part 1A:

e) Write a one~two sentence description of how the model is performing. Which one is performing better? What makes the output “bad”?

The model performs best with the trigram and the four-gram, and performs with startling grammatical accuracy, even though the meaning of the sentences are usually gibberish. The output is “bad” when the sentences produced don’t follow typical sentence structure of verb, subject, object (depending on the chosen language).

Part 1B:

Which sentence has the lowest perplexity? Which sentence has the highest? Why?

The first sentence from the actual text has the lowest perplexity, while the sentence with a word that isn’t found at all in the source text is the highest at infinity. This is because perplexity is based on a log value of the probability of finding a certain sequence in the source text. If those words are taken verbatim from the test, the model will be the least perplexed, because the chance at finding that string is basically guaranteed. The second sentence, built from the trigram model of the same text, has a higher perplexity. That sentence is found exactly in the text, but all of its words are in similar structural contexts, so the perplexity is higher, but not impossible to calculate. The last sentence is at ‘inf’ perplexity, because the chances of finding the word in the text are impossible. This could be solved with some smoothing, if we wanted it.