

## CSCI 5832 - Natural Language Processing

1. Bigram model is better. Because bigram model sentence probability is more when compared to unigram model.

$$P(\text{sentence} \mid \text{model} = \text{bigram}) > P(\text{sentence} \mid \text{model} = \text{unigram})$$

2. Considering all the sentences, unigram model is better. Because bigram model sentence probability is “undefined” or zero if the bigram is unseen in the training file, however it's not the case in unigram model.

3. Bigram model gets the higher probability. Because probability density is not divided across unseen words.

$$\frac{C(W_1, W_2)}{C(W_1)} > \frac{C(W_1, W_2) + k}{C(W_1) + kV}$$

4. Bigram smoothed model is better because it performs well when there are lot of unseen bigram words in the test file.