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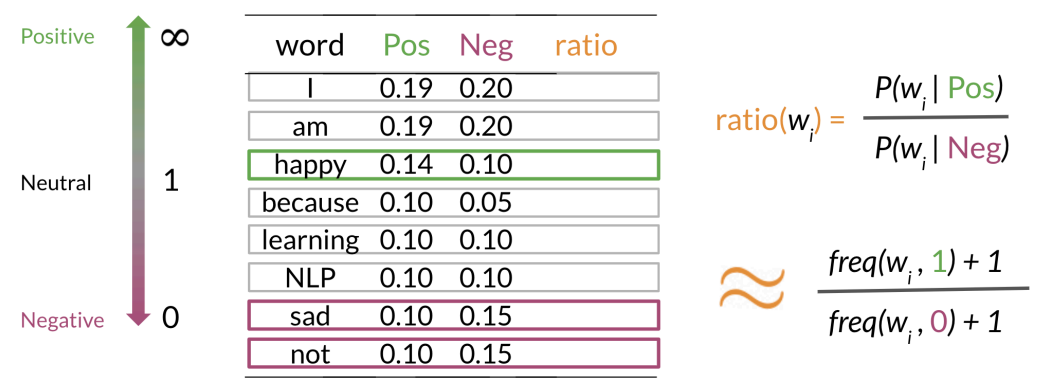
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Week 2 > Log Likelihood, Part 1

# Log Likelihood, Part 1

To compute the log likelihood, we need to get the ratios and use them to compute a score that will allow us to decide whether a tweet is positive or negative. The higher the ratio, the more positive the word is:



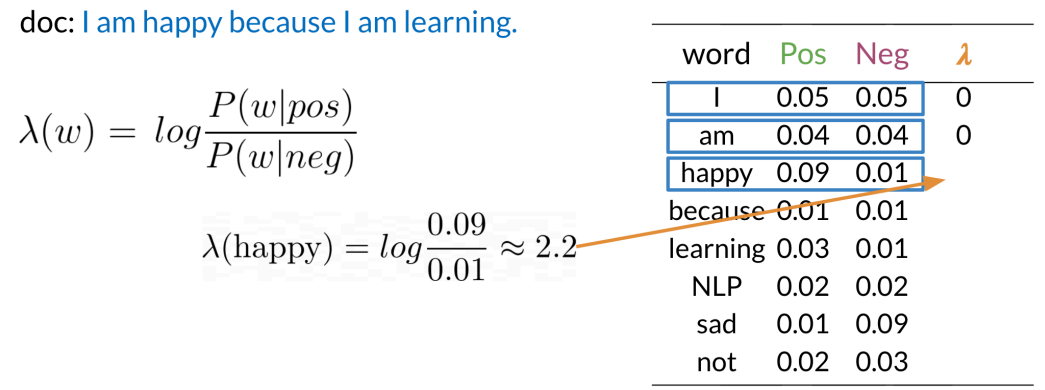
To do inference, you can compute the following:

$$\frac{P(pos)}{P(neg)} \prod_{i=1}^m \frac{P(w_i|pos)}{P(w_i|neg)} > 1$$

As  $m$  gets larger, we can get numerical flow issues, so we introduce the log, which gives you the following equation:

$$\log \left( \frac{P(pos)}{P(neg)} \prod_{i=1}^n \frac{P(w_i|pos)}{P(w_i|neg)} \right) \Rightarrow \log \frac{P(pos)}{P(neg)} + \sum_{i=1}^n \log \frac{P(w_i|pos)}{P(w_i|neg)}$$

The first component is called the log prior and the second component is the log likelihood. We further introduce  $\lambda$  as follows:



Having the  $\lambda$  dictionary will help a lot when doing inference.

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