



Generative Language Models

Please note: Even though the homework assignments are optional and will be neither corrected nor graded, you are encouraged to answer them, as they will help you prepare for your final exam.

Document 1	The house in the town had the big old keeps
Document 2	In the big old house in the big old gown
Document 3	The old night keeper keeps the keep in the town

Given the above collection of documents. Use MLE (Maximum likelihood estimator) to estimate the corresponding of Document 1 by:

1. Using a unigram model coupled with simple smoothing, where $\alpha=1$.
2. Using a unigram model coupled with simple Linear smoothing, where $\lambda=0.5$
3. Referring to the language model you estimated for document 1 in exercise .1, what's the probability that the corresponding language model generated the following query: old house keeps?