

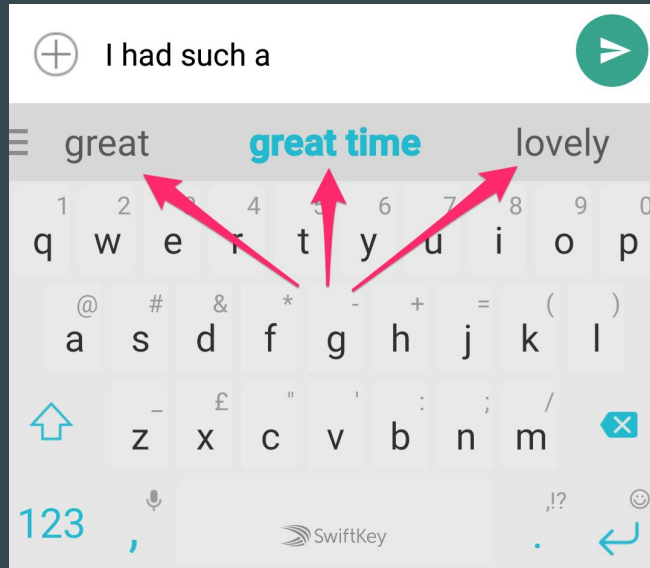
Next-word Prediction with Approach Federated Learning

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Business Understanding

Predict the next word ensuring data privacy



Collect Initial Data

- The data consists in Shakespeare's plays
- Hosted in Project Gutenberg
- Unique file with all plays
- txt format
- Script to download

Describe Data

- Total rows: 124.788
- Total tokens: 1.134.708
- Total characters: 5.465.129
- Total unique character: 91
- Sample, first 500 characters:

Sample:

The Project Gutenberg EBook of The Complete Works of William Shakespeare, by William Shakespeare

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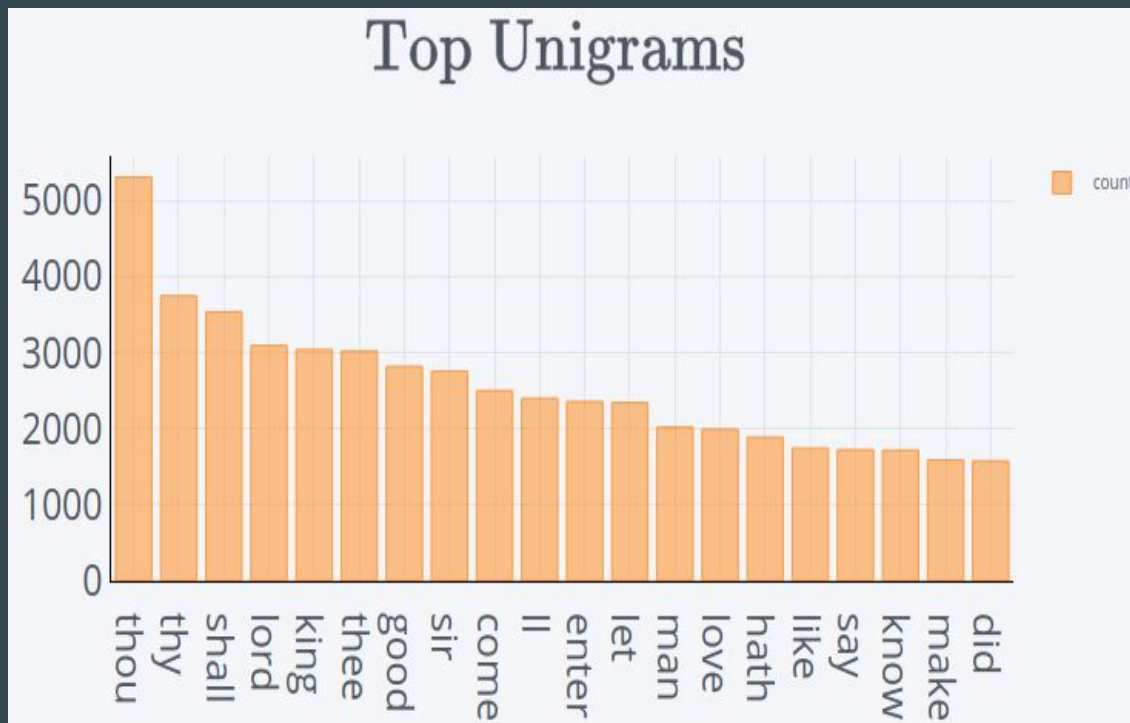
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Title: The Comple

Preprocessing

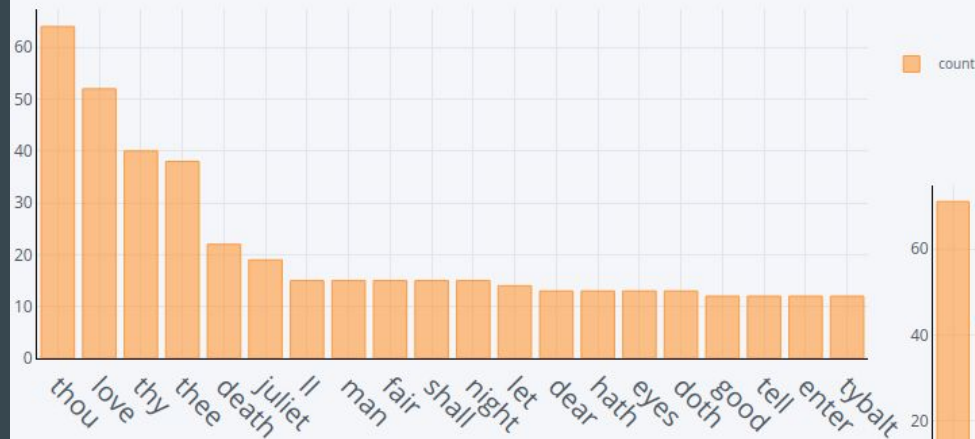
- Function to remove unnecessary text
- Bag-of-Words
- Term Frequency and Inverse Document Frequency (TF-IDF)
- Latent Dirichlet Allocation (LDA)

Explore Data (n-grams)

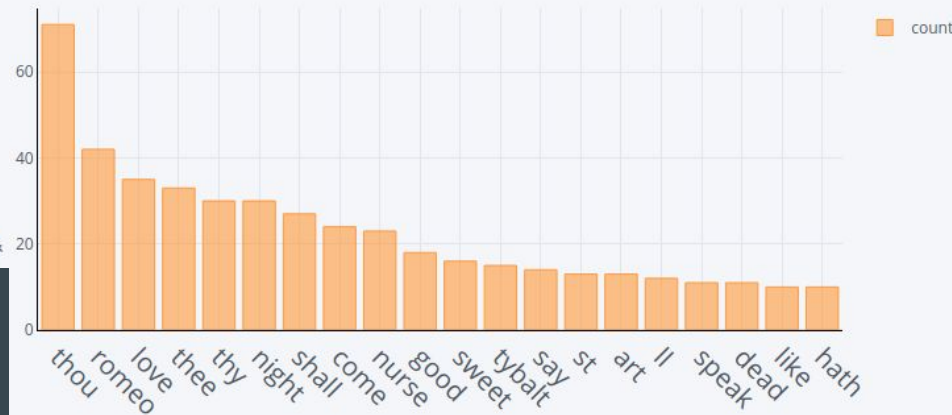


Explore Data (n-grams): Romeo and Juliet

Romeo: Top Unigrams



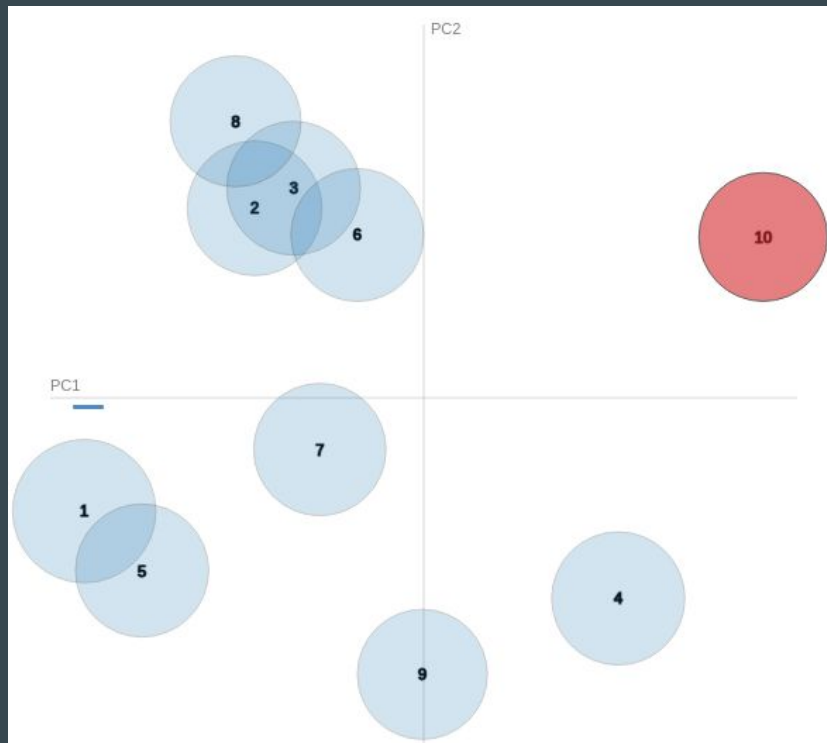
Juliet: Top Unigrams



Word Topic Clusters

By analyzing the words, topics can be classified:

- Topic 1: Family Duel
- Topic 2: Actions of a king
- Topic 3: Romantic dispute
- Topic 4: Farewell (Despedida)
- Topic 5: Relationship between queen, mother, prince and gentleman



NOTE: Each bubble represents a topic

Federation Design

- To simulate the federation of clients, the module will be used `tff.simulation`
- 715 users where each example corresponds to a data set of spoken by the character in a given play.

Valeu

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/brunocampos01



/LarissaPeluso