

Unit 1: Preprocessing

IPM Text Analysis

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Goal: Prepare texts into format used for computational text analysis

Method: Preprocessing recipe

Decisions: Feature selection, Non-english and multilingual issues.

Key Terms:

- Corpus / document
- Encoding
- Preprocessing
- Tokens, grams
- Stemming / Lemmatize,
- Bag of Words
- Document-Term Matrix

Key R Packages

- tm

Preparing a Corpus

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My preferred structure: Each document a row, one column for text, and other columns for metadata.

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Caution

‘‘Turkey’’ = ‘‘turkey’’

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[a, any, are, civil, engaged, great, in, nation, now, or,
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Bigrams [now we, we are, are engaged, engaged in, in a, a great, great civil, civil war, war testing, testing whether, whether that, that nation, nation or, or any, any nation]

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Bigrams [now we, we are, are engaged, engaged in, in a, a great, great civil, civil war, war testing, testing whether, whether that, that nation, nation or, or any, any nation]

Trigrams [now we are, we are engaged, are engaged in, engaged in a, in a great, a great civil, great civil war, civil war testing, war testing whether, testing whether that, whether that nation, that nation or, nation or any, or any nation]

Bigrams

Bigram	Count
now we	1
we are	1
are engaged	1
engaged in	1
in a	1
a great	1
great civil	1
civil war	1
war testing	1
testing whether	1
whether that	1
that nation	1
nation or	1
or any	1
any nation	1

Trigrams

Trigram	Count
now we are	1
we are engaged	1
are engaged in	1
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in a great	1
a great civil	1
great civil war	1
civil war testing	1
war testing whether	1
whether that nation	1
that nation or	1
nation or any	1
or any nation	1

How Could This Possibly Work?

Speech is:

- Ironic

Thanks, Obama

- Subtle Negation (Source: Janyce Wiebe) :

They have not succeeded, and will never succeed, in
breaking the will of this valiant people

- Order Dependent (Source: Arthur Spirling):

Peace, no more war

War, no more peace

How Could This Possibly Work?

Three answers

- 1) **It might not**: Validation is critical (task specific)
- 2) **Central Tendency in Text**: Words often imply what a text is about
war, civil, union or tone consecrate, dead, died, lives.
Likely to be used repeatedly: create a theme for an article
- 3) **Proof in the pudding**: Bag-of-words assumption works for a number of applications.

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- Stemming/Lemmatizing algorithms: Many-to-one mapping from words to stem/lemma

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- Weight some terms more than others (tf-idf)

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Step 2: Tokenize:

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Step 3: Remove stop words:

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Step 5: Create Count Vector

Stem	Count
ago	1
brought	1
seven	1
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conceiv	1
men	1
father	1
⋮	⋮

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To the R code!