Finding hidden topics in documents and other text analyses in R

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R-Ladies

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Extracting information from text

- Word frequency
- Word clouds
- Sentiment analysis
- Topic modeling

Extracting information from text

- **Word frequency**
- Word clouds
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bigram <chr>	n <int>
professor mcgonagall	578
uncle vernon	386
harry potter	349
death eaters	346
harry looked	316
harry ron	302
aunt petunia	206
invisibility cloak	192
professor trelawney	177
dark arts	176

1-10 of 89,120 rows Previous 1 2 3 4 5 6 … 100 Next

Source: https://bit.ly/3gOmLTu

* I do not endorse J.K.R.'s transphobic opinions

Extracting information from text

- Word frequency
- **Word clouds**
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Wordcloud of Harry Potter and the Sorcerer's Stone

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Why participate in R-ladies?

"I like to be part of a group"

"We can learn together"

"They teach us new things in R"

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Latent Dirichlet Allocation (LDA) to model **documents**

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Latent Dirichlet Allocation (LDA) to model **documents**

- Behind the **documents**, there can be a number of latent **topics**

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Latent Dirichlet Allocation (LDA) to model **documents**

- Behind the **documents**, there can be a number of latent **topics**
- The choice of **words** in the **documents** are related to the **topics**

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- A **topic** is composed of a mixture of **words**.

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Latent Dirichlet Allocation (LDA) to model **documents**

- Behind the **documents**, there can be a number of latent **topics**
- The choice of **words** in the **documents** are related to the **topics**
- A **topic** is composed of a mixture of **words**.
- Interpret **topics** by their **words** composition.

Topic analysis

Steps to follow in practice:

1. Define what is a **document**
2. Get the set of documents
3. Preprocess the documents:
   - **Filter out** non informative words (e.g. prepositions) and lemmatize
   - Prepare input for LDA: list of words per document and their frequency
4. Fit **LDA** with fixed number of topics (you can use a selection criterion)
5. **Interpret** topics

Case-study: movement ecology

Identify the main topics in this field of science in the last decade

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Identify the main topics in this field of science in the last decade

Collaborators:

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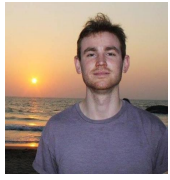

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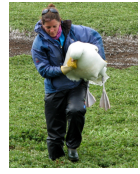

S. Patrick

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HFSP

collaborator

noun [C]

UK /kəlæb.ə.reɪ.təʳ/ **US** /kəlæb.ə.reɪ.ţə-/

collaborator ***noun*** **[C] (ENEMY SUPPORTER)**

disapproving

a person who works with an enemy who has taken control of their country:

- *wartime collaborators*
- *a Nazi collaborator*

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collaborator *noun* [C] (WORKING WITH)

a person who works together with others for a special purpose:

- *a new production by Andrew Davies and collaborators*

Meaning of **collaborator** in English

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In practice, for our case study:

1. Define what is a **document**: an abstract of a movement ecology paper

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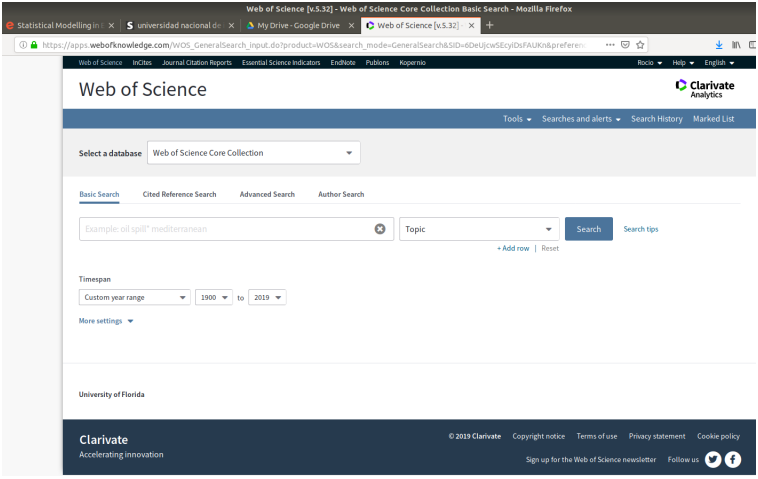
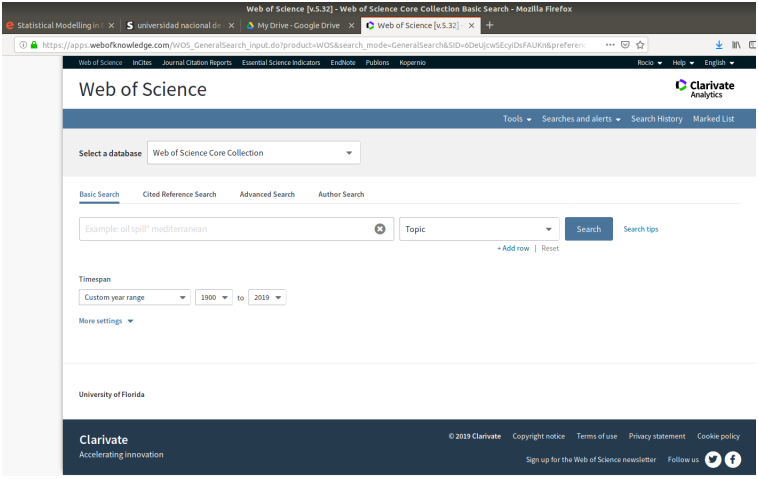
1. Define what is a **document**: an abstract of a movement ecology paper
2. Get the set of documents



Topic analysis

In practice, for our case study:

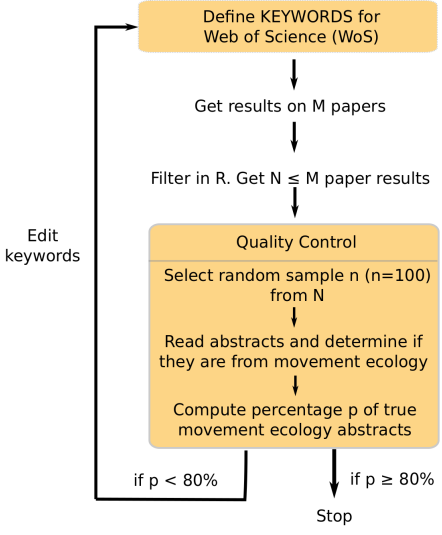
1. Define what is a **document**: an abstract of a movement ecology paper
2. Get the set of documents (example of query result)



Topic analysis

In practice, for our case study:

1. Define what is a **document**: an abstract of a movement ecology paper
2. Get the set of documents: Example on website



Topic analysis

In practice, for our case study:

1. Define what is a document: an abstract of a movement ecology paper
2. Get the set of documents: 8007 abstracts

Topic analysis

In practice, for our case study:

1. Define what is a document: an abstract of a movement ecology paper
2. Get the set of documents: 8007 abstracts
3. Preprocess the documents:
   - **Filter out** non informative words (e.g. prepositions) and lemmatize
   - Prepare input for LDA: list of words per document and their frequency
4. Fit **LDA** with fixed number of topics (you can use a selection criterion)
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Let's go to the codes! Accessible on website