NLP processing from R

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Why linguistic processing

- Stemming sucks (sorry)
  - Not too badly for English
- Computational Linguistics built some great tools
  - to extract basic structure of text
  - to help filter out uninteresting features
  - to help enrich words
- We can use these to improve our analyses

Steps in linguistic processing

- (cleaning UTF, HTML etc)
- Tokenization
- POS tagging
- Lemmatization
- Entity Recognition
- Dependency parsing
- Coreference resolution

POS tagging

Identify Part-of-speech (POS) of words:

- noun
- name
- verb
- pronoun
- etc.

Great for focussing on certain classes, filtering out function words

Lemmatization

Reduce word to lemma
flew -> fly went -> go
Like stemming, but better^{TM}

Entity recognition

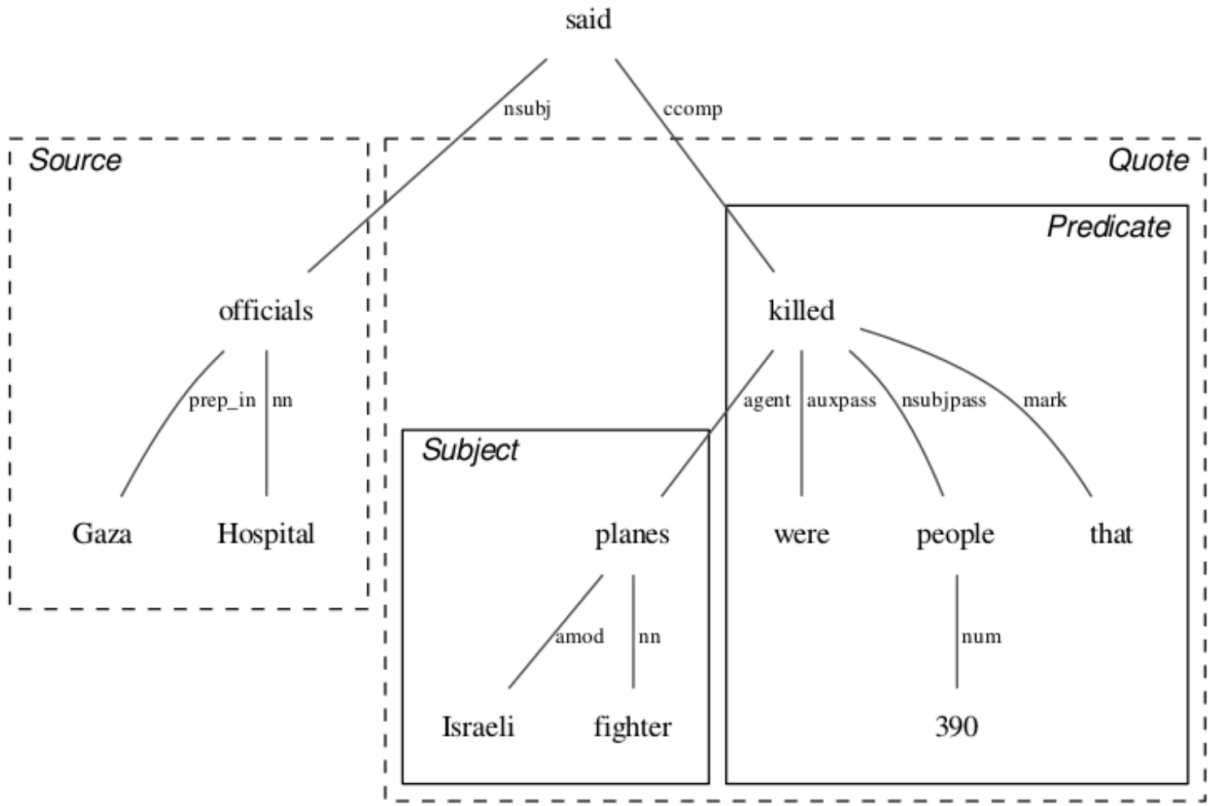
Recognize named entities

- Person
- Organization
- Location
- etc.

Great for building e.g. actor networks, exploring data

Dependency Parsing

- Grammatical structure of sentences



Hospital officials in Gaza said that 390 people were killed by Israeli fighter planes

Coreference Resolution

- (aka anaphora resolution)
- What do 'he', 'she', 'the president' etc refer to?
- Very important in text-level analyses

Running NLP in R

- Is complicated (sorry)

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- Different NLP groups publish different programs
- Attempts are made to unify them (spacy, coreNLP)
- And R packages exists (coreNLP, spacyr)
- But it can be non-trivial to install

Running NLP in R: your options

- Spacy + spacyr
- coreNLP
- for Dutch: frog + frogr
- nlpiper

Spacy + spacyr

- POS, Lemmatization, parsing for 7 languages
- Install: (`https://spacy.io/usage/`)
  1. Windows: install python (e.g. anaconda)
  2. Windows: install VS express; Mac: install xcode
  3. Using python/pip or conda, install spacy package
  4. Using python, download language model
- Run:

```
library(spacyr)
spacy_initialize("de", executable="/path/to/python")
tokens = spacy_parse('ich bin ein Berliner')
```

coreNLP

```
library(coreNLP)
downloadCoreNLP()
initCoreNLP(type='english')
output = annotateString("I love Hannover")
getToken(output)
```

frog + frogr

1. Install docker
2. Run frog:

```
sudo docker run -dp 9887:9887 proycon/lamachine \      f
```

1. Install and run frogr:

```
devtools::install_github("vanatteveldt/frogr")
library(frogr)
tokens = frogr::call_frog("Tulpen uit Amsterdam",
                          port=9887)
```

nlpipe(r)

```
library(nlpiper)
id = process_async("corenlp_lemmatize",
                   "This is a test")
status(id)
tokens = result("corenlp_lemmatize", id,
                format='csv'
```

Spacy and Quanteda

- Spacy results can be directly loaded into quanteda
- See handout!