

Natural Language Processing Lab

Week 6

Jason S. Chang 張俊盛 jason@nlpplab.cc

TAs : Kevin Tuan 段凱文 kevintuan@nlpplab.cc

Course Website:

Date:

Table of Contents

- Constituency and Dependency
- spaCy.io
- Exercise

The linguistic structure of sentences:

Constituency = phrase structure grammar
= context-free grammars (CFGs)

Phrase structure organizes words into nested constituents

- Start with a single word

the, cat, cuddly, by, door

- Combine words into phrases

the cuddly cat, by the door

- Further combine into longer phrases

the cuddly cat by the door

CFG

- For example:

Grammar

$S \rightarrow NP \ VP$

$VP \rightarrow V \ PP$

$PP \rightarrow P \ NP$

$NP \rightarrow (Det) \ (Adj) \ N$

Lexicon

N: Noun

V: Verb

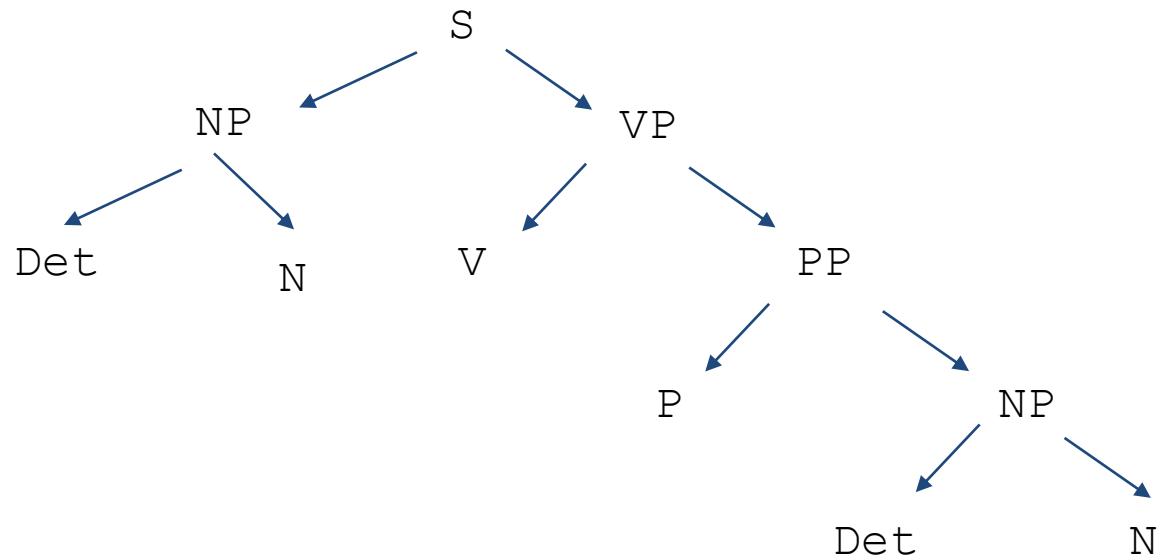
Det: Determinant

Adj: Adjective

P: Preposition

CFG

The dog barked at the post officer.



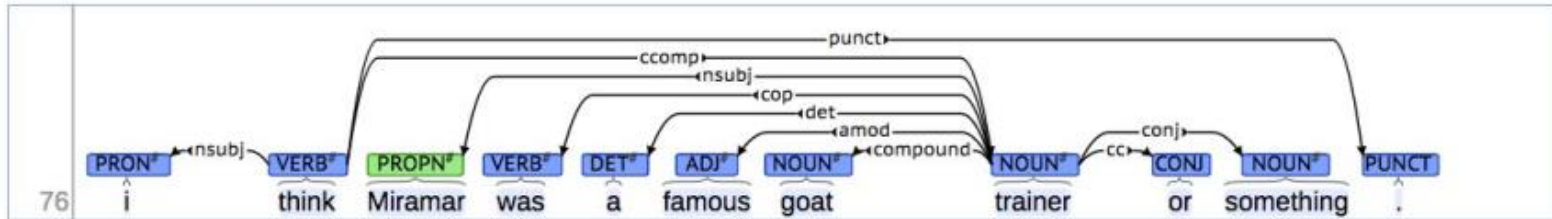
The dog barked at the post officer

The linguistic structure of sentences:

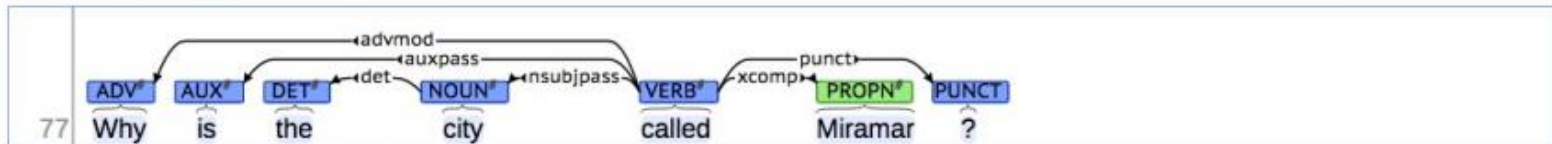
Dependency

Dependency structure shows which words depend on (modify, attach to, or are arguments of) which other words.

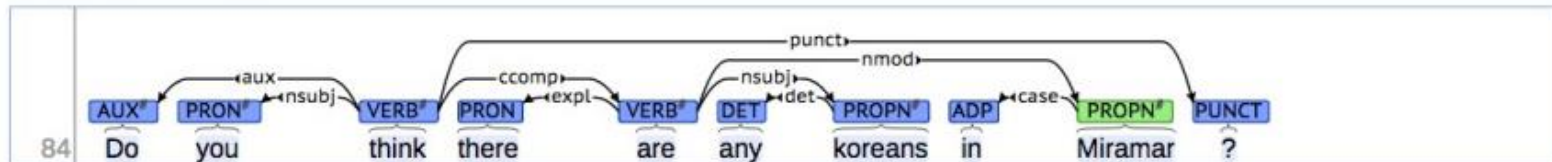
[context] [conllu]



[context] [conllu]

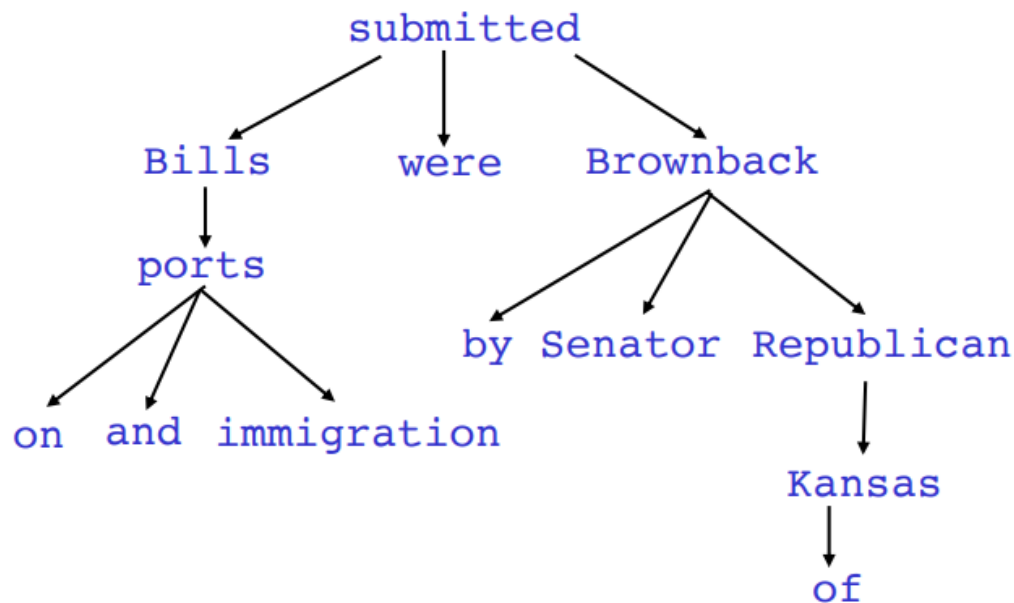


[context] [conllu]



Dependency Grammar and Dependency Structure

Dependency syntax postulates that syntactic structure consists of relations between lexical items, normally binary asymmetric relations (“arrows”) called dependencies

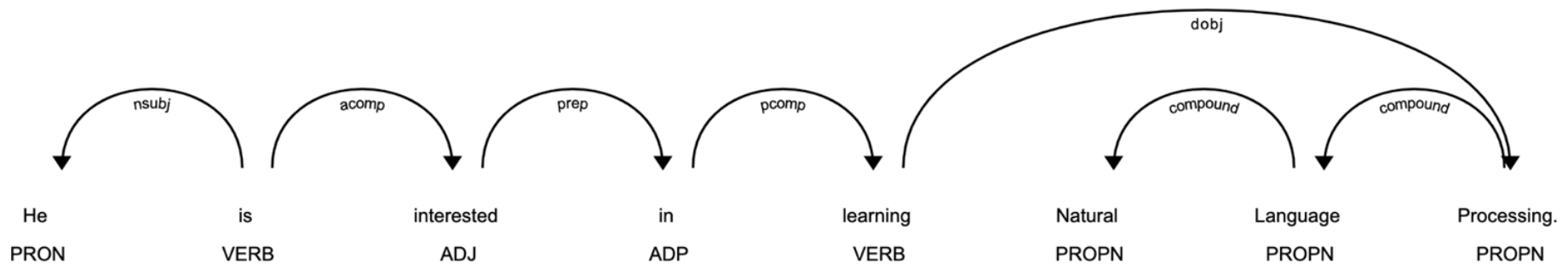


spaCy

spaCy

Fortunately, we don't have to build our own dependency parser. We introduce a very useful package spaCy

- <https://spacy.io/>



spaCy

Installation:

```
! pip install spacy
```

```
! python -m spacy download
```

```
en_core_web_sm
```

Import:

```
>>> import spacy
```

```
>>> nlp = spacy.load('en_core_web_sm')
```

Tutorial:

<https://www.machinelearningplus.com/spacy-tutorial-nlp/>