Python for Data Science Cheat Sheet spaCy

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About spaCy

spaCy is a free, open-source library for advanced Natural Language Processing (NLP) in Python. It's designed specifically for production use and helps you build applications that process and "understand" large volumes of text. **Documentation:** spacy.io

```
$ pip install spacy
```

```
import spacy
```

Statistical models

Download statistical models

Predict part-of-speech tags, dependency labels, named entities and more. See here for available models: spacy.io/models

```
$ python -m spacy download en_core_web_sm
```

Check that your installed models are up to date

```
$ python -m spacy validate
```

Loading statistical models

```
import spacy
# Load the installed model "en_core_web_sm"
nlp = spacy.load("en_core_web_sm")
```

Documents and tokens

Processing text

Processing text with the `nlp` object returns a `Doc` object that holds all information about the tokens, their linguistic features and their relationships

```
doc = nlp("This is a text")
```

Accessing token attributes

```
doc = nlp("This is a text")
# Token texts
[token.text for token in doc]
# ['This', 'is', 'a', 'text']
```

Spans

Accessing spans

Span indices are **exclusive**. So `doc[2:4]` is a span starting at token 2, up to – but not including! – token 4.

```
doc = nlp("This is a text")
span = doc[2:4]
span.text
# 'a text'
```

Creating a span manually

```
# Import the Span object
from spacy.tokens import Span
# Create a Doc object
doc = nlp("I live in New York")
# Span for "New York" with label GPE (geopolitical)
span = Span(doc, 3, 5, label="GPE")
span.text
# 'New York'
```

Linguistic features

Attributes return label IDs. For string labels, use the attributes with an underscore. For example, `token.pos_` .

Part-of-speech tags

PREDICTED BY STATISTICAL MODEL

```
doc = nlp("This is a text.")
# Coarse-grained part-of-speech tags
[token.pos_ for token in doc]
# ['DET', 'VERB', 'DET', 'NOUN', 'PUNCT']
# Fine-grained part-of-speech tags
[token.tag_ for token in doc]
# ['DT', 'VBZ', 'DT', 'NN', '.']
```

Syntactic dependencies

PREDICTED BY STATISTICAL MODEL

```
doc = nlp("This is a text.")
# Dependency labels
[token.dep_ for token in doc]
# ['nsubj', 'ROOT', 'det', 'attr', 'punct']
# Syntactic head token (governor)
[token.head.text for token in doc]
# ['is', 'is', 'text', 'is', 'is']
```

Named entities

PREDICTED BY STATISTICAL MODEL

```
doc = nlp("Larry Page founded Google")
# Text and label of named entity span
[(ent.text, ent.label_) for ent in doc.ents]
# [('Larry Page', 'PERSON'), ('Google', 'ORG')]
```

Syntax iterators

Sentences

USUALLY NEEDS THE DEPENDENCY PARSER

```
doc = nlp("This a sentence. This is another one.")
# doc.sents is a generator that yields sentence spans
[sent.text for sent in doc.sents]
# ['This is a sentence.', 'This is another one.']
```

Base noun phrases

NEEDS THE TAGGER AND PARSER

```
doc = nlp("I have a red car")
# doc.noun_chunks is a generator that yields spans
[chunk.text for chunk in doc.noun_chunks]
# ['I', 'a red car']
```

Label explanations

```
spacy.explain("RB")
# 'adverb'
spacy.explain("GPE")
# 'Countries, cities, states'
```

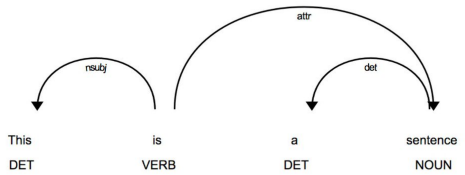
Visualizing

If you're in a Jupyter notebook, use `displacy.render` . Otherwise, use `displacy.serve` to start a web server and show the visualization in your browser.

```
from spacy import displacy
```

Visualize dependencies

```
doc = nlp("This is a sentence")
displacy.render(doc, style="dep")
```



Visualize named entities

```
doc = nlp("Larry Page founded Google")
displacy.render(doc, style="ent")
```

Larry Page PERSON founded Google ORG