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## Dive Into NLTK, Part II: Sentence Tokenize and Word Tokenize

This is the second article in the series “[Dive Into NLTK](#)”, here is an index of all the articles in the series that have been published to date:

[Part I: Getting Started with NLTK](#)

Part II: Sentence Tokenize and Word Tokenize (this article)

Part III: Part-Of-Speech Tagging and POS Tagger

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Tokenizers is used to divide strings into lists of substrings. For example, Sentence tokenizer can be used to find the list of sentences and Word tokenizer can be used to find the list of words in strings.

### Tokenizing text into sentences

Sentence Tokenize also known as [Sentence boundary disambiguation](#), Sentence boundary detection, [Sentence segmentation](#), here is the definition by wikipedia:

*Sentence boundary disambiguation (SBD), also known as sentence breaking, is the problem in natural language processing of deciding where sentences begin and end. Often natural language processing tools require their input to be divided into sentences for a number of reasons. However sentence boundary identification is challenging because punctuation marks are often ambiguous. For example, a period may denote an abbreviation, decimal point, an ellipsis, or an email address – not the end of a sentence. About 47% of the periods in the Wall Street Journal corpus denote abbreviations. As well,*

*question marks and exclamation marks may appear in embedded quotations, emoticons, computer code, and slang. Languages like Japanese and Chinese have unambiguous sentence-ending markers.*

There are many nlp tools include the sentence tokenize function, such as OpenNLP, NLTK, TextBlob, MBSP and etc. Here we will tell the details [sentence segmentation](#) by NLTK.

### How to use sentence tokenize in NLTK?

After [installing nltk and nltk\\_data](#) , you can launch python and import sent\_tokenize tool from nltk:

```
>>> text = "this's a sent tokenize test. this is sent two. is this sent three? sent 4 is cool! Now it's your turn."
>>> from nltk.tokenize import sent_tokenize
>>> sent_tokenize_list = sent_tokenize(text)
>>> len(sent_tokenize_list)
5
>>> sent_tokenize_list
["this's a sent tokenize test.", 'this is sent two.', 'is this sent three?', 'sent 4 is cool!', "Now it's your turn."]
```

sent\_tokenize uses an instance of PunktSentenceTokenizer from the nltk.tokenize.punkt module. This instance has already been trained on and works well for many European languages. So it knows what punctuation and characters mark the end of a sentence and the beginning of a new sentence.

sent\_tokenize is one of instances of PunktSentenceTokenizer from the nltk.tokenize.punkt module. Tokenize Punkt module has many pre-trained tokenize model for many european languages, here is the list from the [nltk\\_data/tokenizers/punkt/README](#) file:

*Pretrained Punkt Models — Jan Strunk (New version trained after issues 313 and 514 had been corrected)*

*Most models were prepared using the test corpora from Kiss and Strunk (2006). Additional models have been contributed by various people using NLTK for sentence boundary detection.*

*For information about how to use these models, please confer the tokenization HOWTO:  
<http://nltk.googlecode.com/svn/trunk/doc/howto/tokenize.html>*

and chapter 3.8 of the NLTK book:

<http://nltk.googlecode.com/svn/trunk/doc/book/ch03.html#sec-segmentation>

There are pretrained tokenizers for the following languages:

*File Language Source Contents Size of training corpus(in tokens) Model contributed by*

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*czech.pickle Czech Multilingual Corpus 1 (ECI) Lidove Noviny ~345,000 Jan Strunk / Tibor Kiss  
Literarni Noviny*

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*danish.pickle Danish Avisdata CD-Rom Ver. 1.1. 1995 Berlingske Tidende ~550,000 Jan Strunk / Tibor Kiss  
(Berlingske Avisdata, Copenhagen) Weekend Avisen*

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*dutch.pickle Dutch Multilingual Corpus 1 (ECI) De Limburger ~340,000 Jan Strunk / Tibor Kiss*

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*english.pickle English Penn Treebank (LDC) Wall Street Journal ~469,000 Jan Strunk / Tibor Kiss  
(American)*

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*estonian.pickle Estonian University of Tartu, Estonia Eesti Ekspress ~359,000 Jan Strunk / Tibor Kiss*

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*finnish.pickle Finnish Finnish Parole Corpus, Finnish Books and major national ~364,000 Jan Strunk / Tibor Kiss  
Text Bank (Suomen Kielen newspapers  
Tekstipankki)  
Finnish Center for IT Science  
(CSC)*

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*french.pickle French Multilingual Corpus 1 (ECI) Le Monde ~370,000 Jan Strunk / Tibor Kiss  
(European)*

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*german.pickle German Neue Zürcher Zeitung AG Neue Zürcher Zeitung ~847,000 Jan Strunk / Tibor*

*Kiss*

*(Switzerland) CD-ROM*

*(Uses "ss"*

*instead of "ß")*

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*greek.pickle Greek Efstathios Stamatatos To Vima (TO BHMA) ~227,000 Jan Strunk / Tibor Kiss*

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*italian.pickle Italian Multilingual Corpus 1 (ECI) La Stampa, Il Mattino ~312,000 Jan Strunk / Tibor Kiss*

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*norwegian.pickle Norwegian Centre for Humanities Bergens Tidende ~479,000 Jan Strunk / Tibor Kiss*  
*(Bokmål and Information Technologies,*  
*Nynorsk) Bergen*

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*polish.pickle Polish Polish National Corpus Literature, newspapers, etc. ~1,000,000 Krzysztof Langner*  
*(<http://www.nkjp.pl/>)*

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*portuguese.pickle Portuguese CETENFolha Corpus Folha de São Paulo ~321,000 Jan Strunk / Tibor Kiss*  
*(Brazilian) (Linguatca)*

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*slovene.pickle Slovene TRACTOR Delo ~354,000 Jan Strunk / Tibor Kiss*  
*Slovene Academy for Arts*  
*and Sciences*

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*spanish.pickle Spanish Multilingual Corpus 1 (ECI) Sur ~353,000 Jan Strunk / Tibor Kiss*  
*(European)*

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*swedish.pickle Swedish Multilingual Corpus 1 (ECI) Dagens Nyheter ~339,000 Jan Strunk / Tibor Kiss*  
*(and some other texts)*

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*turkish.pickle Turkish METU Turkish Corpus Milliyet ~333,000 Jan Strunk / Tibor Kiss*  
*(Türkçe Derlem Projesi)*  
*University of Ankara*

*The corpora contained about 400,000 tokens on average and mostly consisted of newspaper text converted to*

*Unicode using the codecs module.*

*Kiss, Tibor and Strunk, Jan (2006): Unsupervised Multilingual Sentence Boundary Detection. Computational Linguistics 32: 485-525.*

— Training Code —

```
# import punkt
import nltk.tokenize.punkt

# Make a new Tokenizer
tokenizer = nltk.tokenize.punkt.PunktSentenceTokenizer()

# Read in training corpus (one example: Slovene)
import codecs
text = codecs.open("slovene.plain", "Ur", "iso-8859-2").read()

# Train tokenizer
tokenizer.train(text)

# Dump pickled tokenizer
import pickle
out = open("slovene.pickle", "wb")
pickle.dump(tokenizer, out)
out.close()
```

---

There are total 17 european languages that NLTK support for sentence tokenize, and you can use them as the following steps:

```
>>> import nltk.data
>>> tokenizer = nltk.data.load('tokenizers/punkt/english.pickle')
>>> tokenizer.tokenize(text)
```

```
["this's a sent tokenize test.", 'this is sent two.', 'is this sent three?', 'sent 4 is cool!', "Now it's your turn."]
```

Here is a spanish sentence tokenize example:

```
>>> spanish_tokenizer = nltk.data.load('tokenizers/punkt/spanish.pickle')
>>> spanish_tokenizer.tokenize('Hola amigo. Estoy bien.')
['Hola amigo.', 'Estoy bien.']
>>>
```

## Tokenizing text into words

Tokenizing text into words in NLTK is very simple, just called `word_tokenize` from `nltk.tokenize` module:

```
>>> from nltk.tokenize import word_tokenize
>>> word_tokenize('Hello World.')
['Hello', 'World', '.']
>>> word_tokenize("this's a test")
['this', "'s", 'a', 'test']
```

Actually, `word_tokenize` is a wrapper function that calls `tokenize` by the `TreebankWordTokenizer`, here is the code in NLTK:

```
# Standard word tokenizer.
_word_tokenize = TreebankWordTokenizer().tokenize
def word_tokenize(text):
    """
    Return a tokenized copy of *text*,
    using NLTK's recommended word tokenizer
    (currently :class:`.TreebankWordTokenizer`).
    This tokenizer is designed to work on a sentence at a time.
    """
    return _word_tokenize(text)
```

Another equivalent call method like the following:

```
>>> from nltk.tokenize import TreebankWordTokenizer
>>> tokenizer = TreebankWordTokenizer()
>>> tokenizer.tokenize("this's a test")
['this', "'s", 'a', 'test']
```

Except the `TreebankWordTokenizer`, there are other alternative word tokenizers, such as `PunktWordTokenizer` and `WordPunktTokenizer`.

PunktTokenizer splits on punctuation, but keeps it with the word:

```
>>> from nltk.tokenize import PunktWordTokenizer
>>> punkt_word_tokenizer = PunktWordTokenizer()
>>> punkt_word_tokenizer.tokenize("this's a test")
['this', "'s", 'a', 'test']
```

WordPunctTokenizer splits all punctuations into separate tokens:

```
>>> from nltk.tokenize import WordPunctTokenizer
>>> word_punct_tokenizer = WordPunctTokenizer()
>>> word_punct_tokenizer.tokenize("This's a test")
['This', "'", 's', 'a', 'test']
```

You can choose any word tokenizer in nltk for your using purpose.

Posted by [TextMiner](#)

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6 thoughts on “Dive Into NLTK, Part II: Sentence Tokenize and Word Tokenize”

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**sourabh kulhare**

November 4, 2014 at 4:57 am

I want to process each sentence separately, means take a random text and then work on each sentence of that text to identify that which class is associated to each sentence of that text. So to process on each sentence of the text what function and tool I should use.?

thanks

**TextMiner**[Post author](#)

November 6, 2014 at 3:31 am

Use `sent_tokenize(text)` to get each sentence

**Fred**

July 3, 2015 at 3:51 pm

Hello, if I want to parse phrase, not only single word, using `word_tokenize` seems not tokenize the phrase?

**Kantajit Shaw**

July 9, 2015 at 2:19 pm

I am new to nltk. I was trying some basics.

```
import nltk
nltk.word_tokenize("Tokenize me")
```

gives me this following error

*Traceback (most recent call last):*



```
File "", line 1, in
nltk.word_tokenize("hi im no onee")
File "C:\Python27\lib\site-packages\nltk\tokenize\_init_.py", line 101, in word_tokenize
return [token for sent in sent_tokenize(text, language)]
File "C:\Python27\lib\site-packages\nltk\tokenize\_init_.py", line 85, in sent_tokenize
tokenizer = load('tokenizers/punkt/{0}.pickle'.format(language))
File "C:\Python27\lib\site-packages\nltk\data.py", line 786, in load
resource_val = pickle.load(opened_resource)
AttributeError: 'module' object has no attribute 'defaultdict'
Please help. Please tell me how to fix this error.
```

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