TOOL

Use Cases for Lexical Semantic Relationships

Use this tool to review the types of lexical semantic relationships examined throughout this course, as well as how to access them using WordNet. Note that the following lexical semantic relationships are not explicitly accessible in WordNet.

- **Synonyms.** Words with similar senses.

- **Homophones.** Words that sound the same, but are spelled differently and have different senses. For example, the words "write" and "right" are homophones.

- **Homographs.** Words that are spelled identically but have different senses. "Bat," for example, refers both to a club used for hitting a ball and a nocturnal flying animal.

- **Homonyms.** The superset of homophones and homographs.

Using Python With This Tool

The portions of this tool with a gray background are code text you can use to complete the examples included in this tool. You can also modify these sections to use with your data.
In these examples:

- Commands are the lines of code that don't begin with a pound sign (#). Type these lines into Python to carry out the command.

- Commented text begins with a one-pound sign and explains what the code does.

Setup

Before using WordNet to retrieve various lexical semantic relationships, first use the following code to reset your environment and import all necessary modules.

```
%reset -f
import nltk
from nltk.corpus import wordnet as wn
_ = nltk.download(['wordnet'], quiet=True)
```

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Relationship	WordNet Example

Synset. A set of synonymous lemmas, or synonyms which are semantically equivalent in some contexts. In WordNet, a synset takes the form:
 	
`word_lemma.POS.number`
	Prompt: Retrieve all synsets for the word 'eat'.
	
	In: `wn.synsets('eat')`
	
	Out: `[Synset('eat.v.01'),`
	`Synset('eat.v.02'),`
	`Synset('feed.v.06'),`
	`Synset('eat.v.04'),`
	`Synset('consume.v.05'),`
	`Synset('corrode.v.01')]`

Lemma. A canonical form of a word with a single meaning. Several lemmas make up a synset. In WordNet, lemmas take the form:
 	
`word_lemma.POS.number.lemma_name`
	Prompt: Retrieve all lemmas for the word 'eat'.
	
	In: `wn.lemmas('eat')`
	
	Out: `[Lemma('eat.v.01.eat'),`
	`Lemma('eat.v.02.eat'),`
	`Lemma('feed.v.06.eat'),`
	`Lemma('eat.v.04.eat'),`
	`Lemma('consume.v.05.eat'),`
	`Lemma('corrode.v.01.eat')]`

Entailment. A verb causally evolved from another verb.	**Prompt:** Retrieve all entailments for the first synset of the word 'eat'.
	
	In: `ss = wn.synset('eat.v.01')`
	`ss.entailments()`
	
	Out: `[Synset('chew.v.01'),`
	`Synset('swallow.v.01')]`

Antonyms. Words with opposite senses.	**Prompt:** Retrieve the antonyms of the lemma 'good.a.01'. In: `lm = wn.synset('good.a.01').lemmas()[0]` `lm.antonyms()` Out: `[Lemma('bad.a.01.bad')]`

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Relationship	WordNet Example

Hyponym. A word with a specific meaning that is part of a more general term.
 	
For example, a vehicle is a hypernym of a car, which is a hyponym of a vehicle in this parent-child relationship.
	Prompt: Retrieve the hyponyms of the synset 'dog.n.01'
	
	`In:` ```ss = wn.synset('dog.n.01')```
	`ss.hyponyms()`
	
	`Out:` `[Synset('basenji.n.01'),`
	`Synset('corgi.n.01'),`
	`Synset('cur.n.01'),`
	`Synset('dalmatian.n.02'),`
	`Synset('great_pyrenees.n.01'),`
	`Synset('griffon.n.02'),`
	`Synset('hunting_dog.n.01'),`
	`Synset('lapdog.n.01'),`
	`Synset('leonberg.n.01'),`
	`Synset('mexican_hairless.n.01'),`
	`Synset('newfoundland.n.01'),`
	`Synset('pooch.n.01'),`
	`Synset('poodle.n.01'),`
	`Synset('pug.n.01'),`
	`Synset('puppy.n.01'),`
	`Synset('spitz.n.01'),`
	`Synset('toy_dog.n.01'),`
	`Synset('working_dog.n.01')]`

Hypernym. A general term that also includes the meaning of more specific terms.
 	
For example, a vehicle is a hypernym of a car, which is a hyponym of a vehicle in this parent-child relationship.
	Prompt: Retrieve the hypernyms of the synset 'dog.n.01'
	
	`In:` ```ss = wn.synset('dog.n.01')```
	`ss.hypernyms()`
	
	`Out` `[Synset('canine.n.02'),`
	`Synset('domestic_animal.n.01')]`

Use Cases for Lexical Semantic Relationships

Relationship	WordNet Example
Holonym. The whole in a part/whole relationship. For example, lettuce and tomatoes are meronyms of a sandwich, which is their holonym.	**Prompt:** Retrieve the holonyms of the synset 'tree.n.01'. In: ``` ss = wn.synset('tree.n.01') ss.member_holonyms() ``` Out: `[Synset('forest.n.01')]`

Meronym. The part in a part/whole relationship.
 	
For example, lettuce and tomatoes are meronyms of a sandwich, which is their holonym.
	Prompt: Retrieve the meronyms of the synset 'tree.n.01'.
	
	In:
	``
	ss = wn.synset('tree.n.01')
	ss.part_meronyms()
	``
	
	Out: `[Synset('burl.n.02'),`
	`Synset('crown.n.07'),`
	`Synset('limb.n.02'),`
	`Synset('stump.n.01'),`
	`Synset('trunk.n.01')]`