

# On the Wordnet

John Gamboa

# Lemmas and Lexemes

*In English, for example, run, runs, ran and running are forms of the same lexeme, with run as the lemma. Lexeme, in this context, refers to the set of all the forms that have the same meaning, and lemma refers to the particular form that is chosen by convention to represent the lexeme.*

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- Lexemes → a set of forms with the same “meaning”
- Lemma → a particular form that is chosen (by convention) to represent the lexeme.

Wordnet

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- Large lexical database (over 150,000 entries)
- Contains nouns, verbs, adjectives and adverbs
- Manual annotations
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## Verb

- **S:** (v) **get, acquire** (come into the possession of something concrete or abstract) *"She got a lot of paintings from her uncle"; "They acquired a new pet"; "Get your results the next day"; "Get permission to take a few days off from work"*
- **S:** (v) **become, go, get** (enter or assume a certain state or condition) *"He became annoyed when he heard the bad news"; "It must be getting more serious"; "her face went red with anger"; "She went into ecstasy"; "Get going!"*
- **S:** (v) **get, let, have** (cause to move; cause to be in a certain position or condition) *"He got his squad on the ball"; "This let me in for a big surprise"; "He got a girl into trouble"*
- **S:** (v) **receive, get, find, obtain, incur** (receive a specified treatment (abstract)) *"These aspects of civilization do not find expression or receive an interpretation"; "His movie received a good review"; "I got nothing but trouble for my good intentions"*
- **S:** (v) **arrive, get, come** (reach a destination; arrive by movement or progress) *"She arrived home at 7 o'clock"; "She didn't get to Chicago until after midnight"*
- **S:** (v) **bring, get, convey, fetch** (go or come after and bring or take back) *"Get me those books over there, please"; "Could you bring the wine?"; "The dog fetched the hat"*
- **S:** (v) **experience, receive, have, get** (go through (mental or physical states or experiences)) *"get an idea"; "experience vertigo"; "get nauseous"; "receive injuries"; "have a feeling"*
- **S:** (v) **pay back, pay off, get, fix** (take vengeance on or get even) *"We'll get them!"; "That'll fix him good!"; "This time I got him"*
- **S:** (v) **have, get, make** (achieve a point or goal) *"Nicklaus had a 70"; "The Brazilian team got 4 goals"; "She made 29 points that day"*
- **S:** (v) **induce, stimulate, cause, have, get, make** (cause to do; cause to act in a specified manner) *"The ads induced me to buy a VCR"; "My children finally got me to..."*

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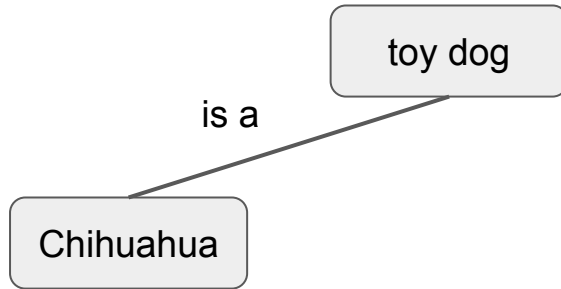
No distinction between  
*Homonymy* and *Polysemy*

# Wordnet -- Hypernymy / Hyponymy

# Wordnet -- Hypernymy / Hyponymy

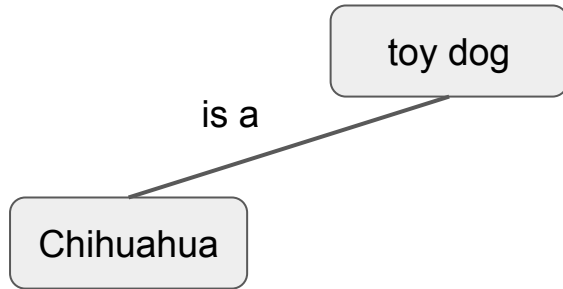
Chihuahua

# Wordnet -- Hypernymy / Hyponymy



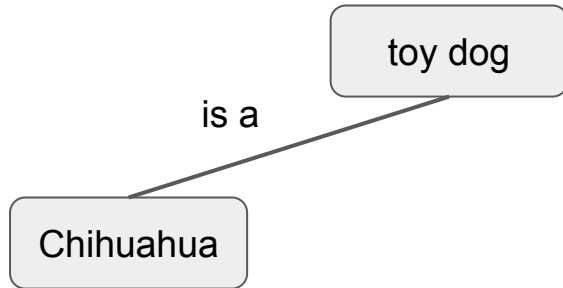


# Wordnet -- Hypernymy / Hyponymy



The following three sentences are equivalent:

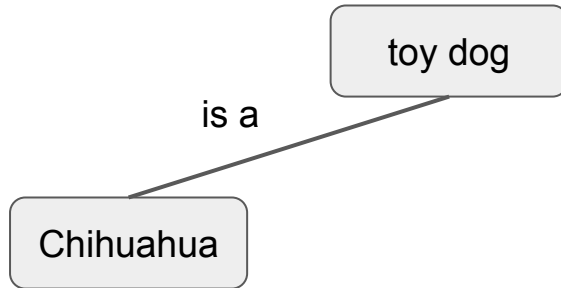
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The following three sentences are equivalent:

*A Chihuahua is a toy dog*

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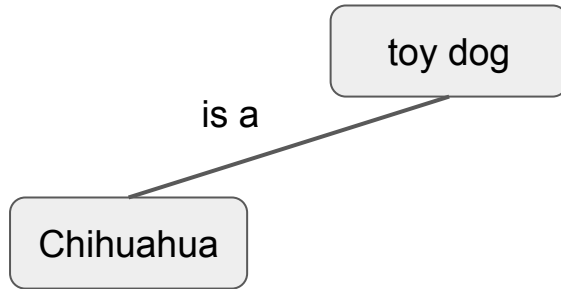


The following three sentences are equivalent:

*A Chihuahua is a toy dog*

*Chihuahua is a hyponym of toy dog*

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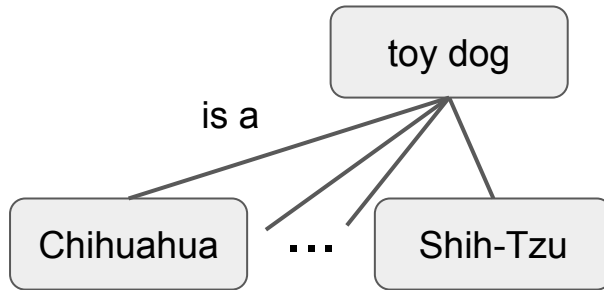
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*toy dog is a hypernym of Chihuahua*

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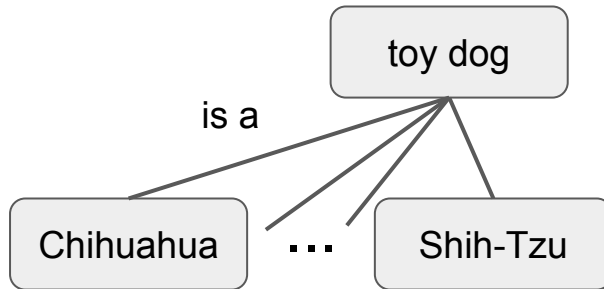
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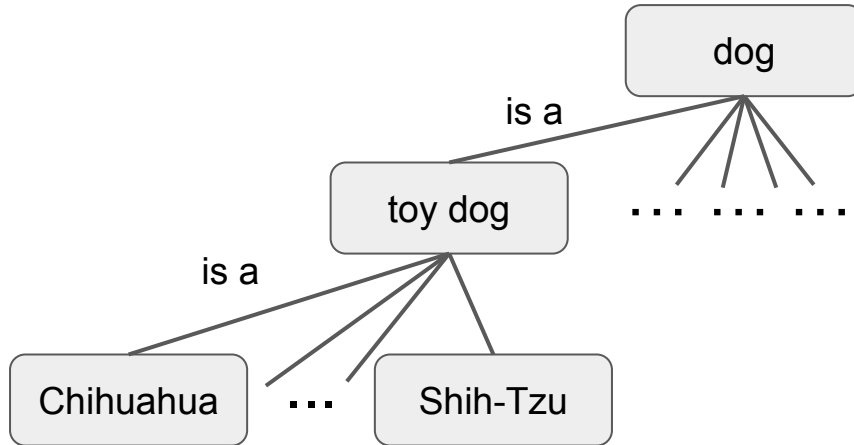
The following three sentences are equivalent:

*A Shih-Tzu is a toy dog*

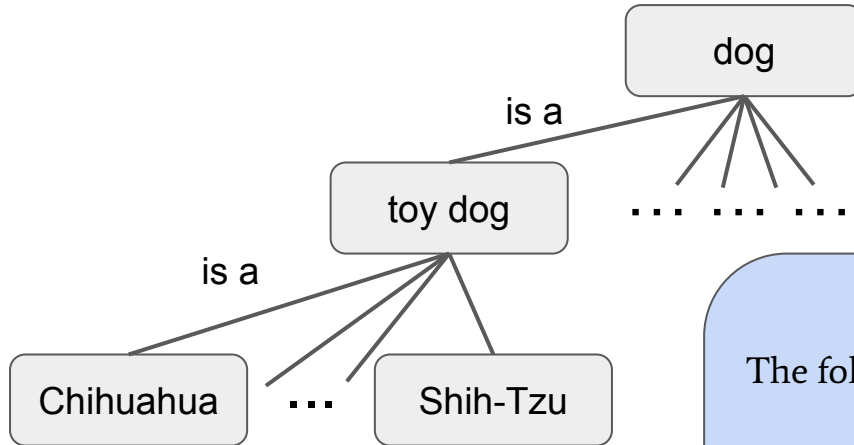
*Shih-Tzu is a hyponym of toy dog*

*toy dog is a hypernym of Shih-Tzu*

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# Wordnet -- Hypernymy / Hyponymy



The following three sentences are equivalent:

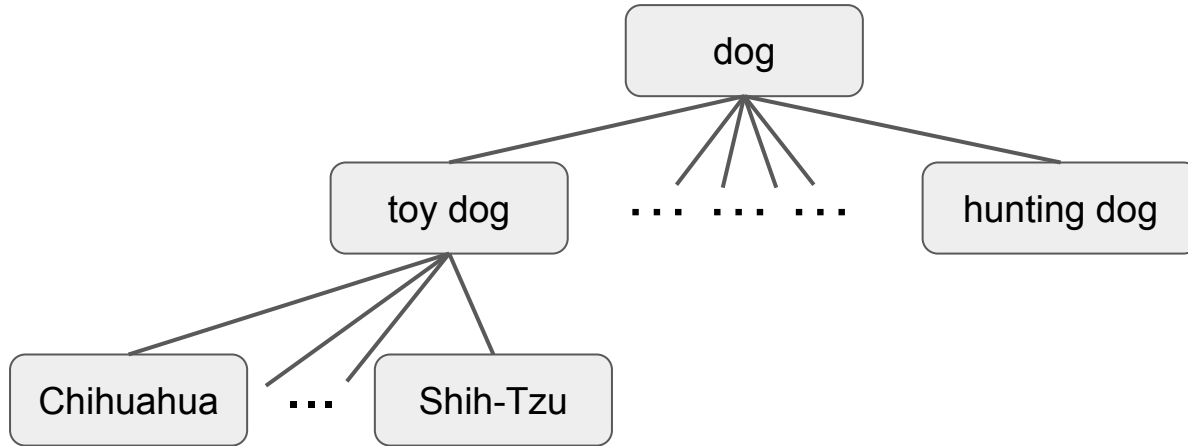
*A toy dog is a dog*

*toy dog is a hyponym of dog*

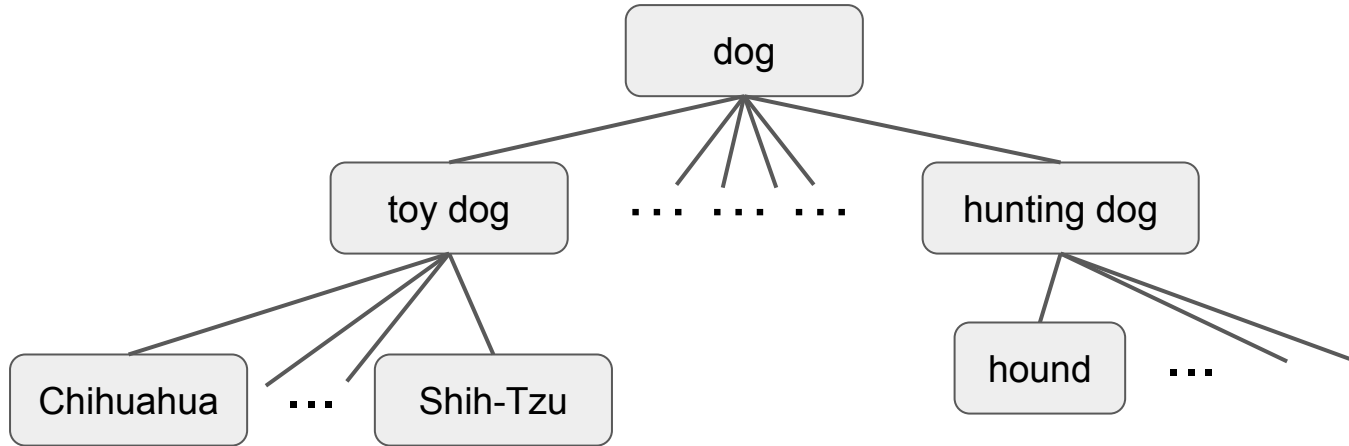
*dog is a hypernym of toy dog*



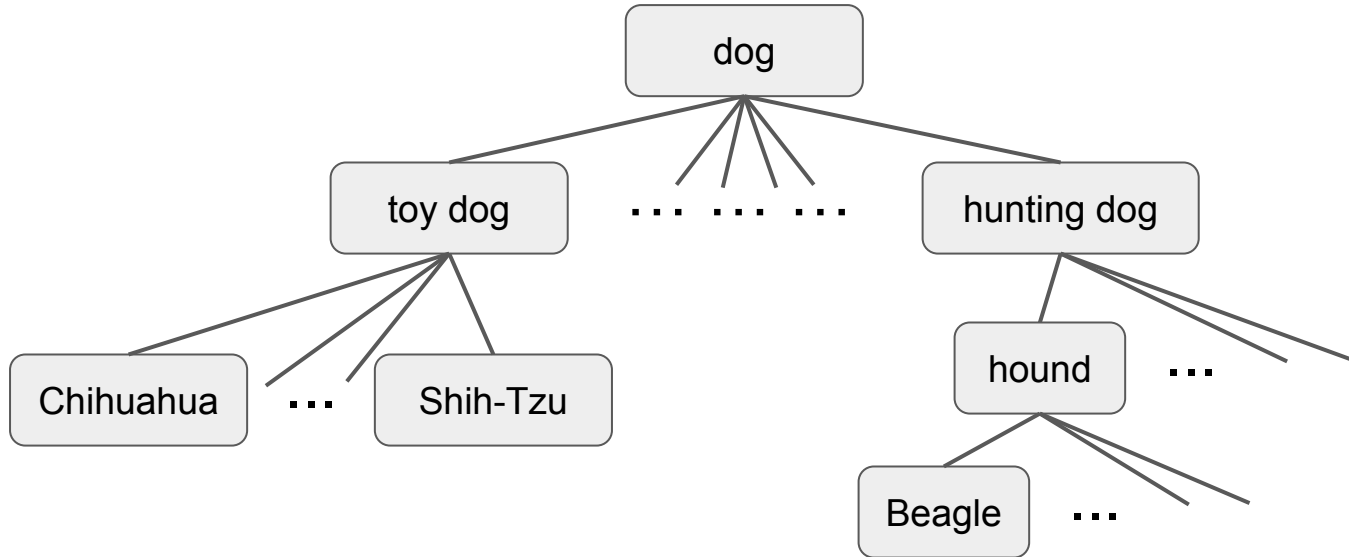
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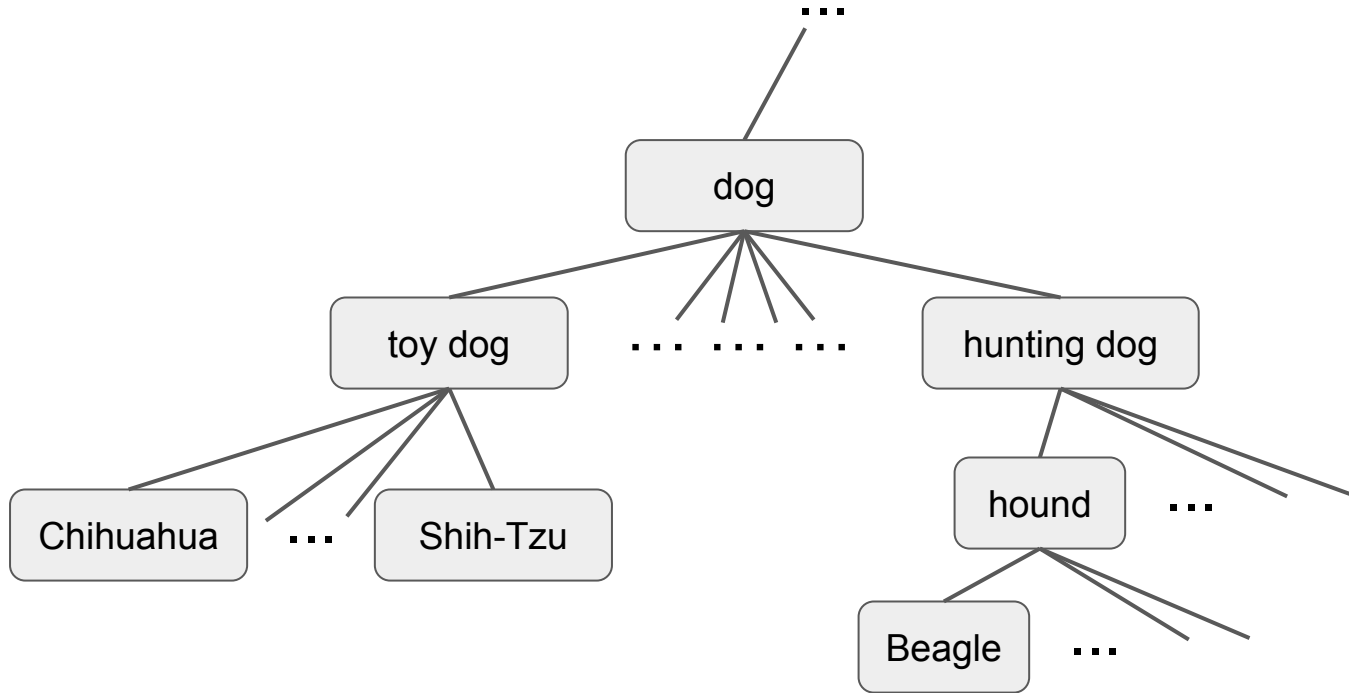
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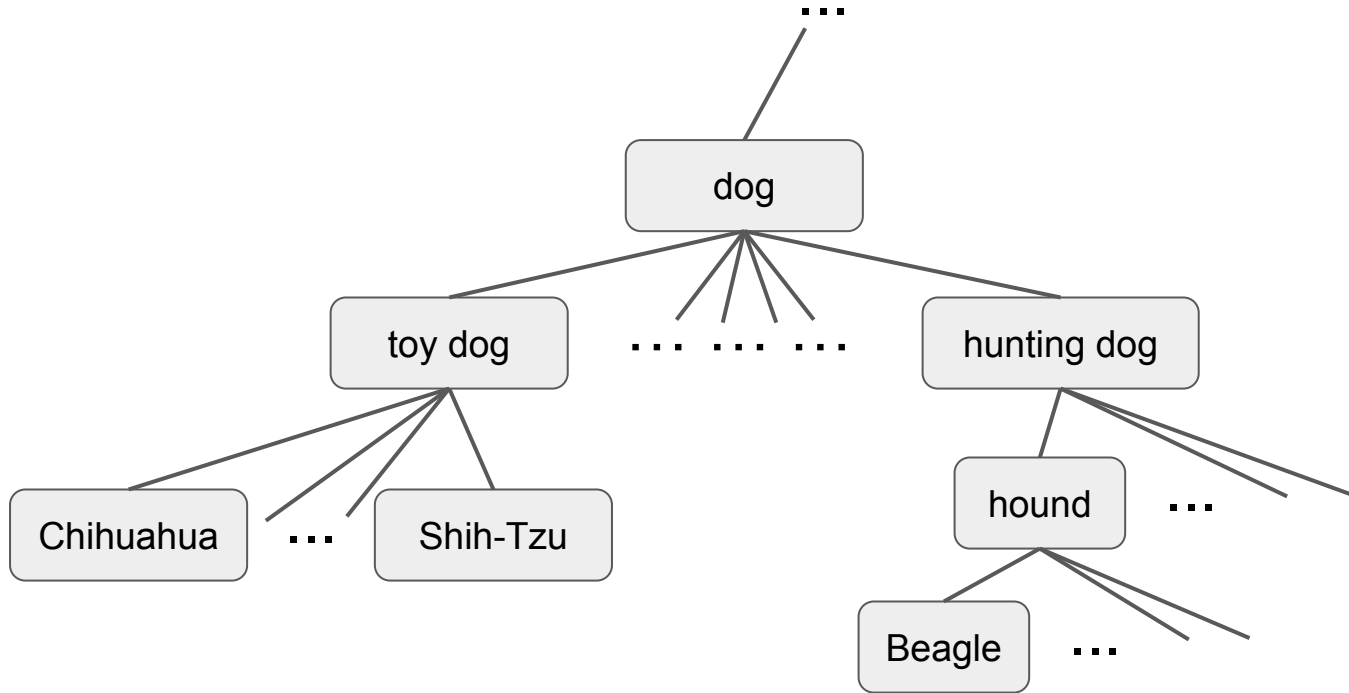
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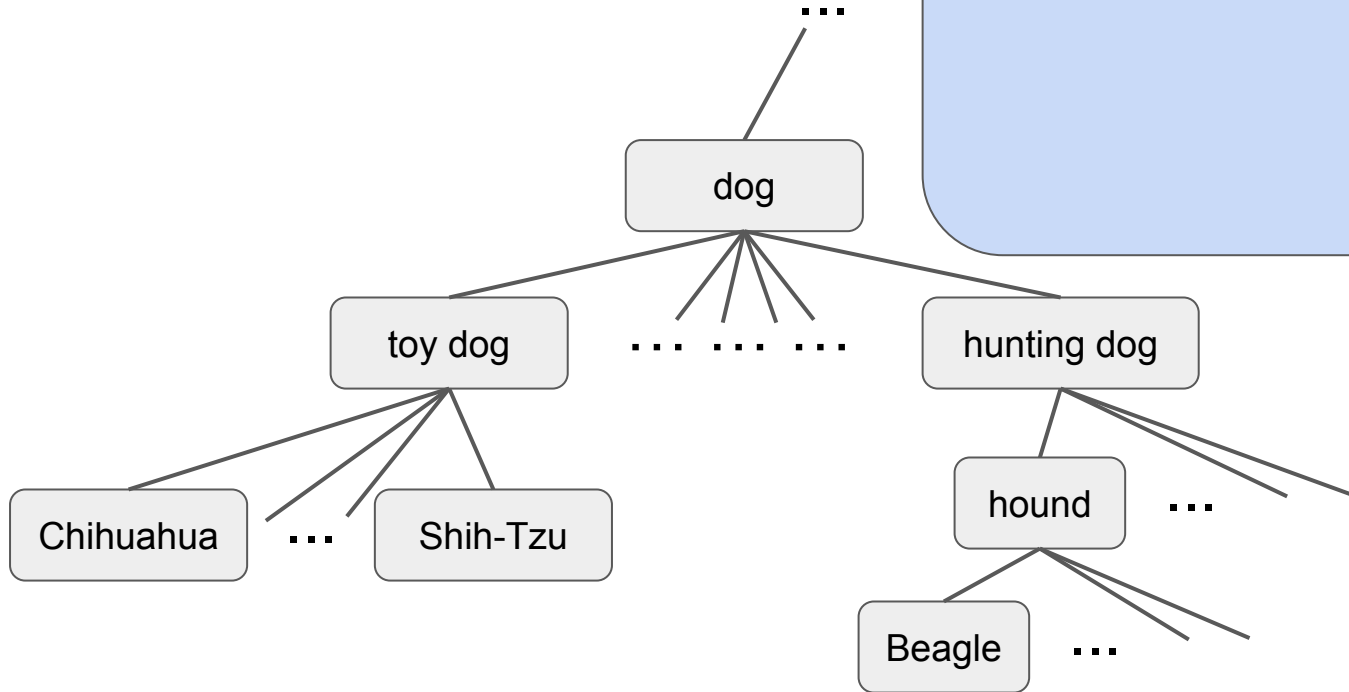


# Wordnet -- Detour: Semantic Similarity



# Wordnet -- Detour: Semantic Sim

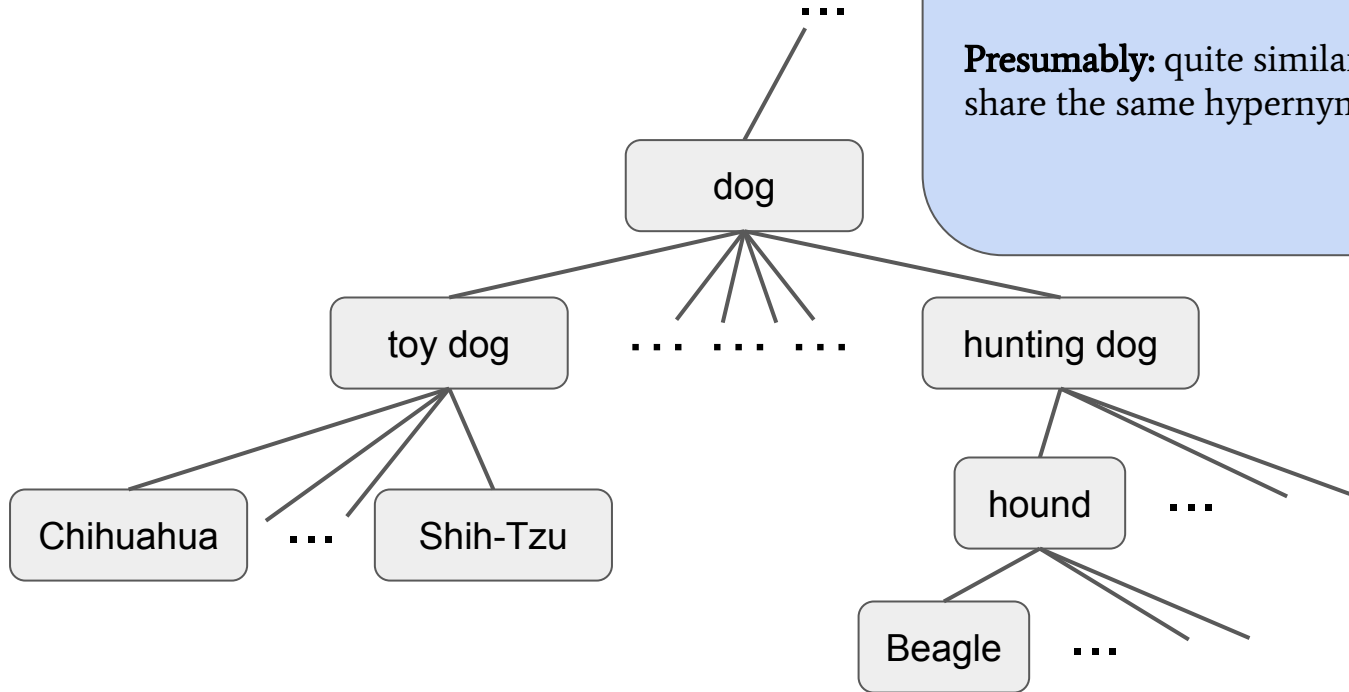
How similar are Chihuahuas and Shih-Tzus?



# Wordnet -- Detour: Semantic Sim

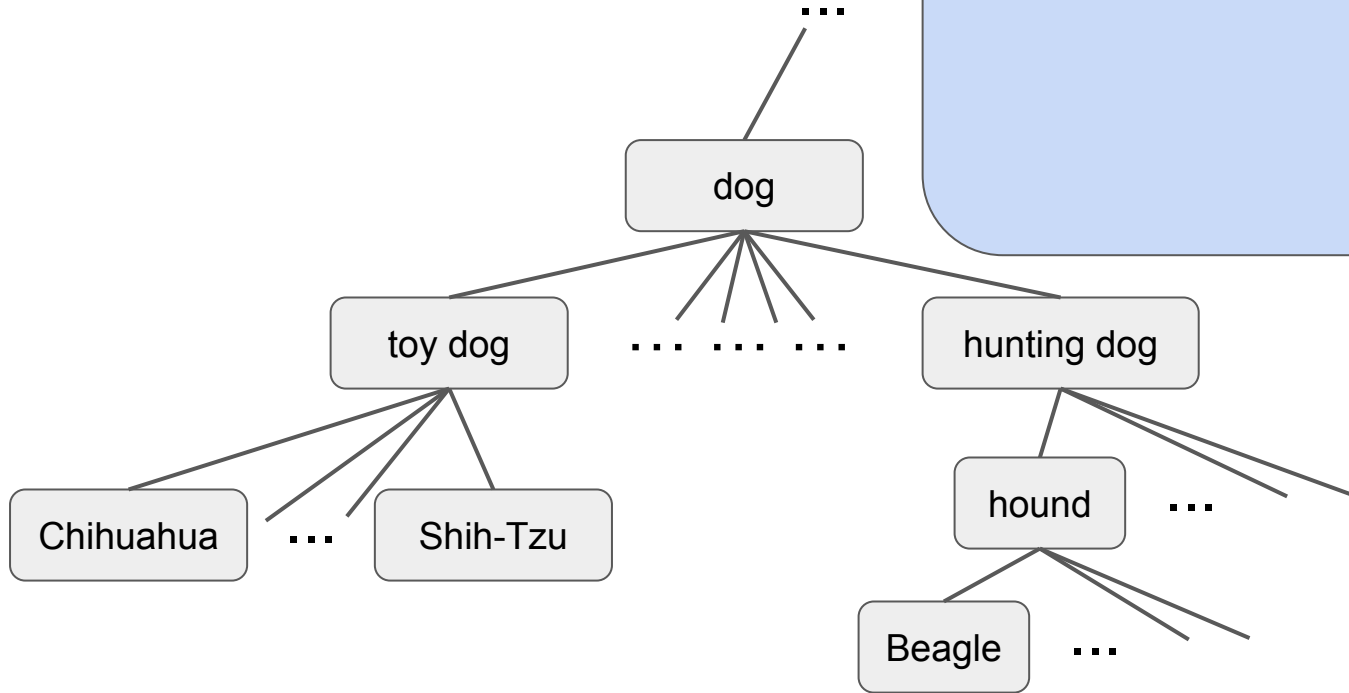
How similar are Chihuahuas and Shih-Tzus?

**Presumably:** quite similar, since they share the same hypernym



# Wordnet -- Detour: Semantic Sim

How similar are Chihuahuas and Beagles?

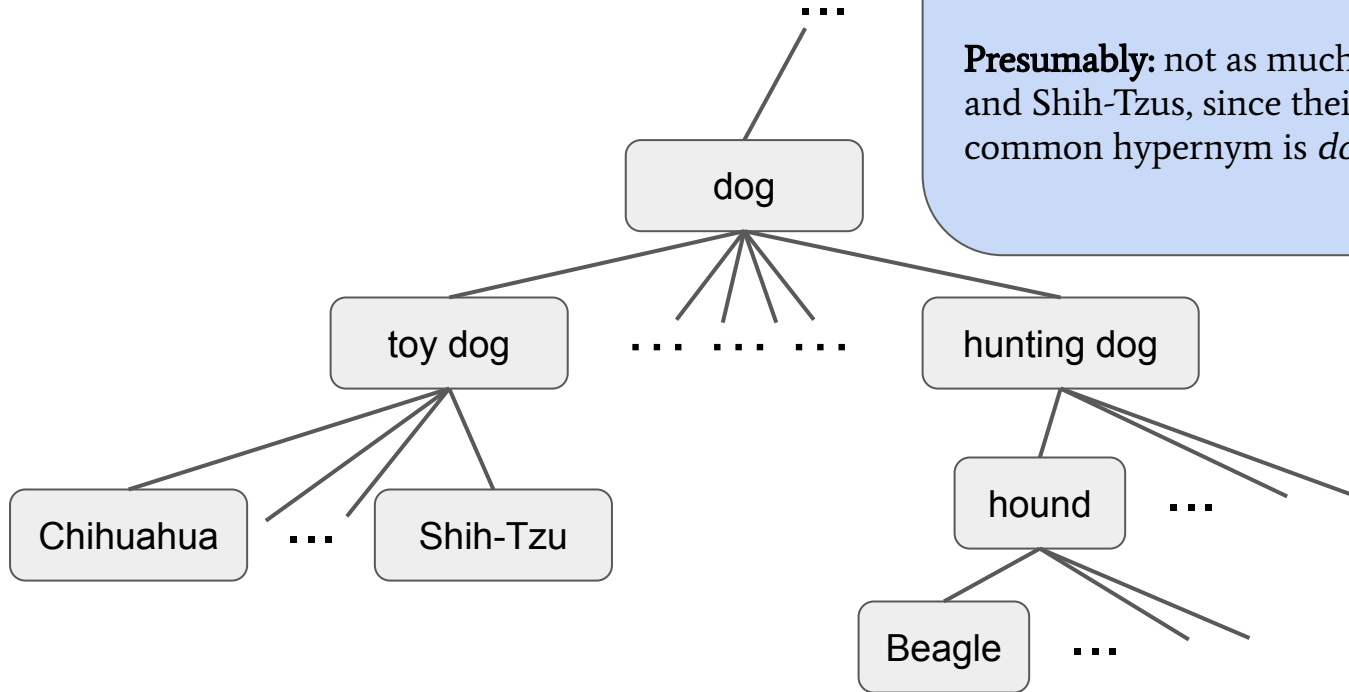




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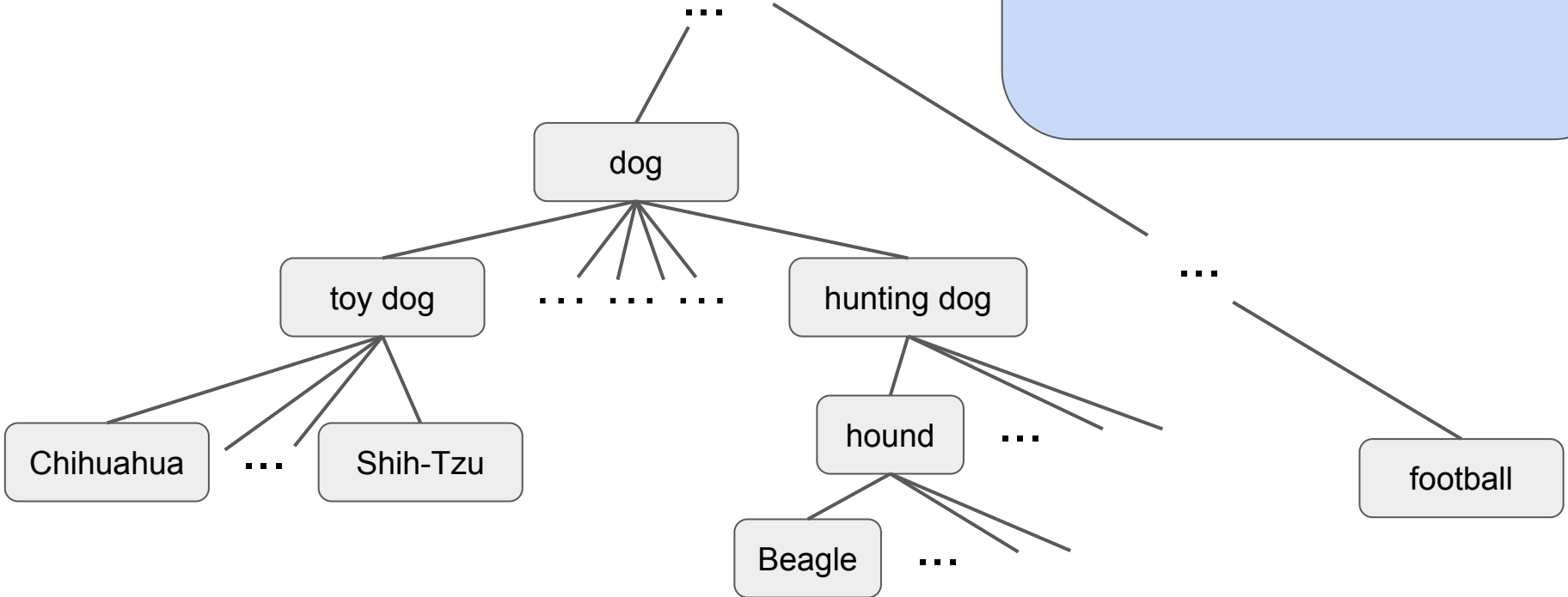
How similar are Chihuahuas and Beagles?

**Presumably:** not as much as Chihuahuas and Shih-Tzus, since their lowest common hypernym is *dog*.



# Wordnet -- Detour: Semantic Sim

How similar are Chihuahuas and football?

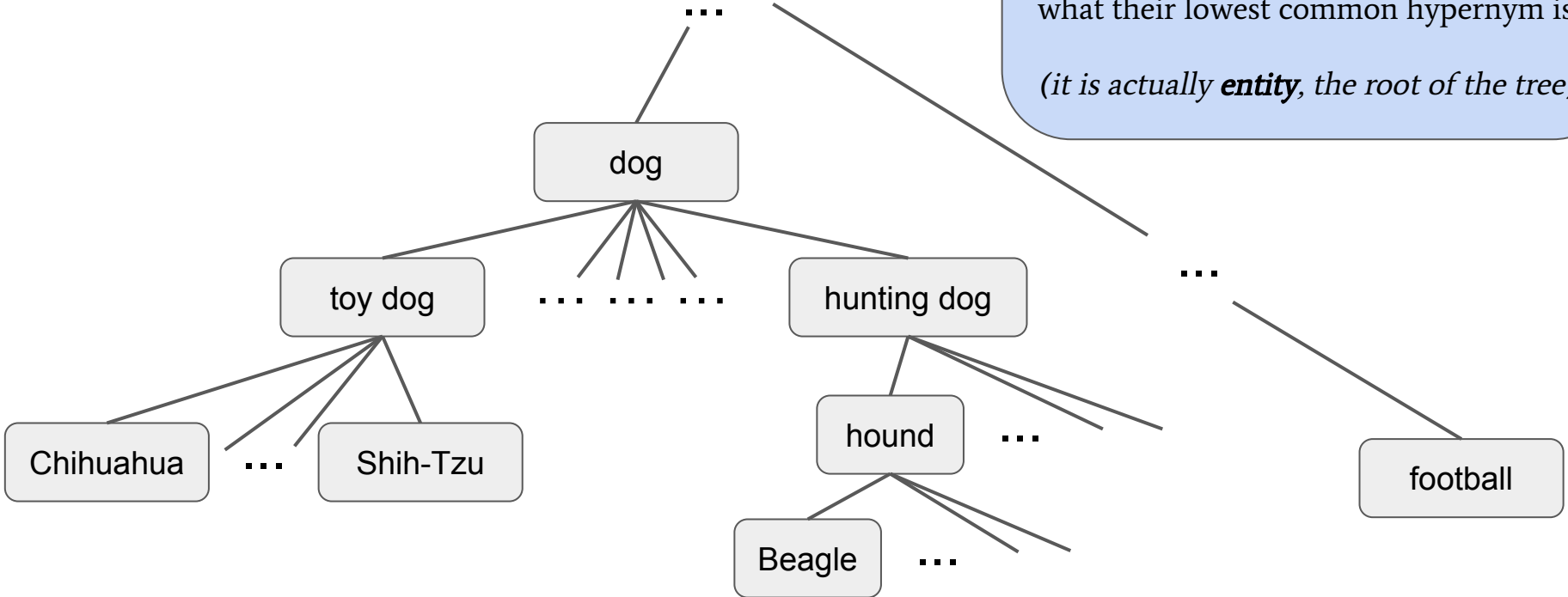


# Wordnet -- Detour: Semantic Sim

How similar are Chihuahuas and football?

**Presumably:** quite different! God knows what their lowest common hypernym is!

*(it is actually **entity**, the root of the tree)*

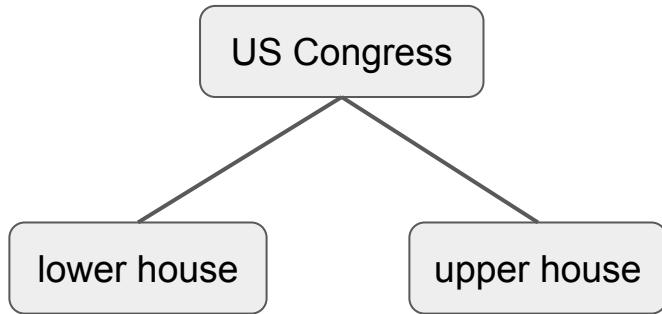


Wordnet Meronym / Holonym

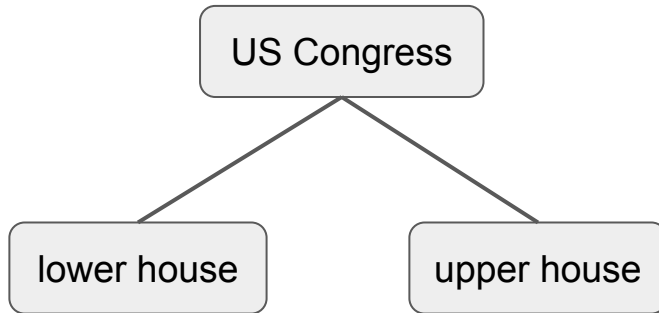
# Wordnet Meronym / Holonym

US Congress

# Wordnet Meronym / Holonym



# Wordnet Meronym / Holonym



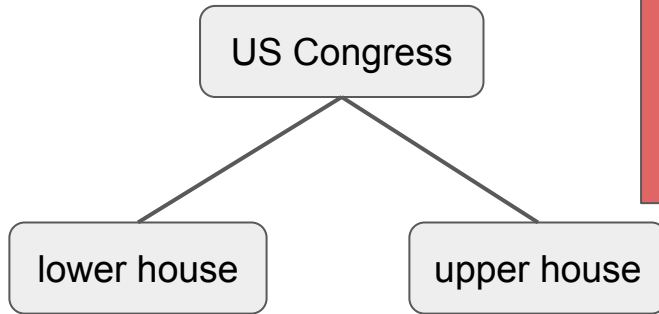
The following sentences are true:

The *US Congress* is composed by the *lower house* and the *upper house*.

The *lower house* and the *upper house* are meronyms of the *US Congress*.

The *US Congress* is a holonym of the *lower house* and the *upper house*.

# Wordnet Meronym / Holonym

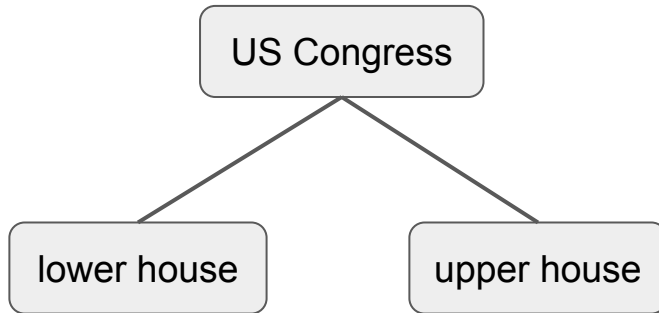


**Actually... there are three types of Meronymy / Holonymy relations...**

The *US Congress* is a holonym of the *lower house* and the *upper house*.



# Wordnet Meronym / Holonym



The following sentences are true:

The *US Congress* **has as its members** the *lower house* and the *upper house*.

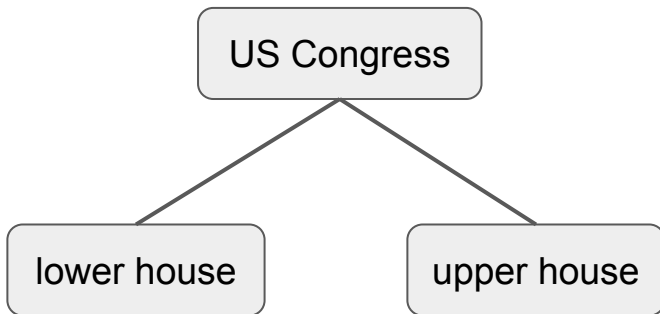
The *lower house* and the *upper house* are **member meronyms** of the *US Congress*.

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# Wordnet Meronym / Holonym

Other examples includes:

- *Forests have trees*
- *Football teams have football players*



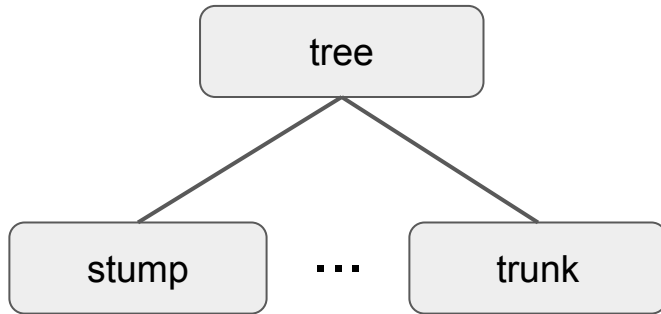
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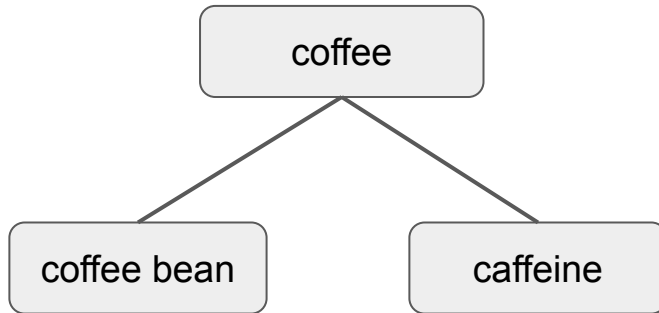
The following sentences are true:

*Trees **have as parts** a stump and a trunk.*

*Stump and trunk are **part meronyms** of trees.*

*Tree is a holonym of stump and trunk.*

# Wordnet Meronym / Holonym



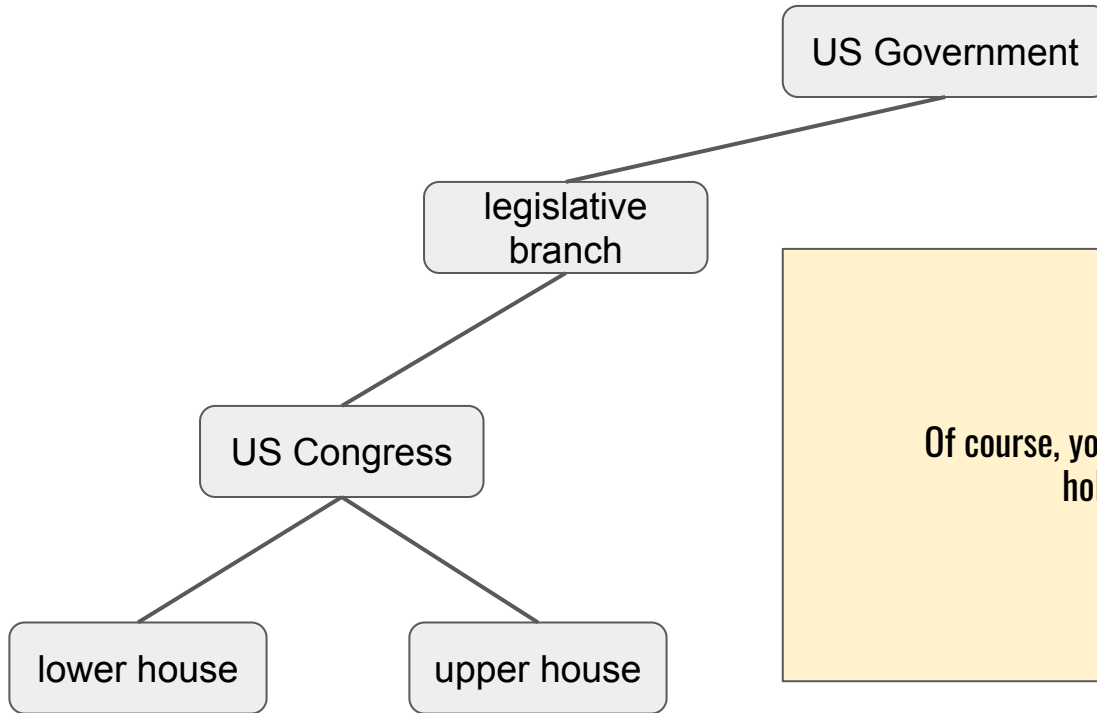
The following sentences are true:

*Coffee is made of (among other things) coffee beans and caffeine.*

*Coffee beans and caffeine are substance meronyms of coffee.*

*Coffee is a holonym of coffee beans and caffeine.*

# Wordnet Meronym / Holonym



Of course, you can also have a hierarchy of holonyms/meronyms...

# Wordnet -- other semantic relations

- Entailment

*If A is true, then B must necessarily be true* (Wikipedia)

E.g., *freeze* entails *solidify*  
*storm* entails *rain*

- Antonymy