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Documenting our languages with Lexeme
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CEE Meeting 2022
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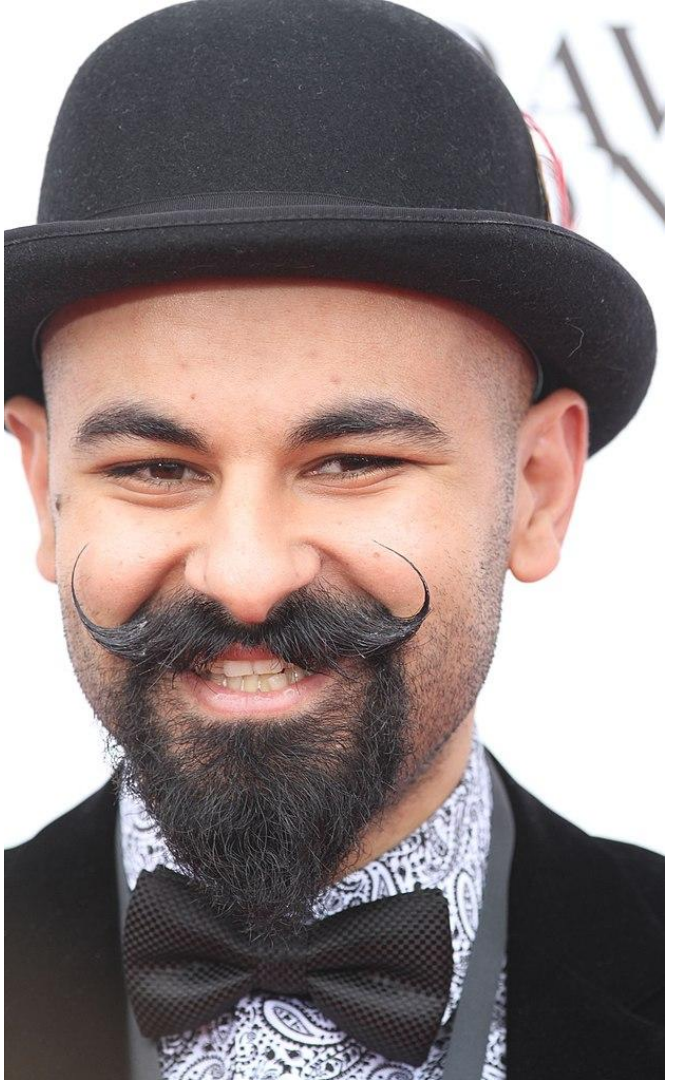
01 What is Lexeme?

And why do I need it in my life?

You are lucky!

You still have time to become **a Lexeme hipster**!

When everybody knows and uses Lexeme, you'll be able to say: "oh yeah, I contributed to Lexeme before it was cool!"

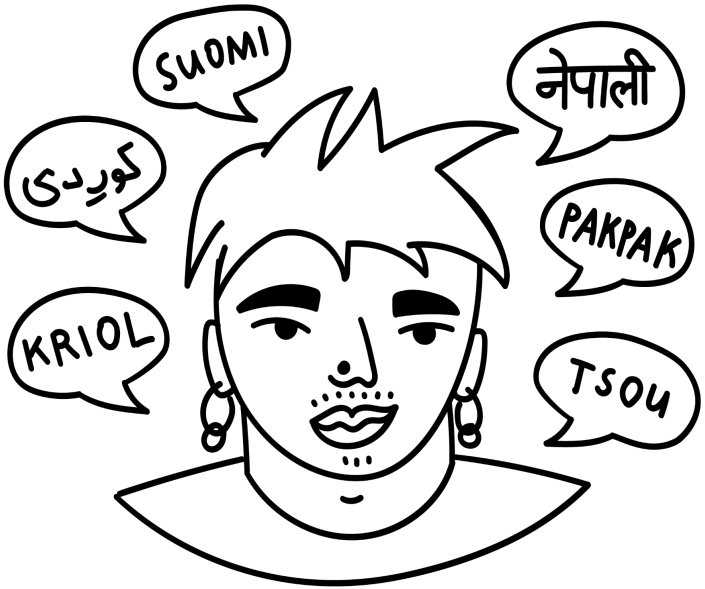


Okay, but why?

Because computers can provide a lot of value for human language **acquisition**, **practice**, **analysis**, **improvement**, and **translation**...

...but for that, they need **structured data** about human languages...

...and human languages are **really complex**!



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Is language so complex?

What does 'dog' mean?
-> "guilt began to dog the thief day and night"
What does 'bat' mean?
-> "the owner hit the burglar with a baseball bat"
What does 'mean' mean?
-> he sure was a mean old man
-> the mean income in her country is lower
What translation would be correct and appropriate for 'dog' or 'mean'? It depends on the *specific sense* and *context* in the source text.

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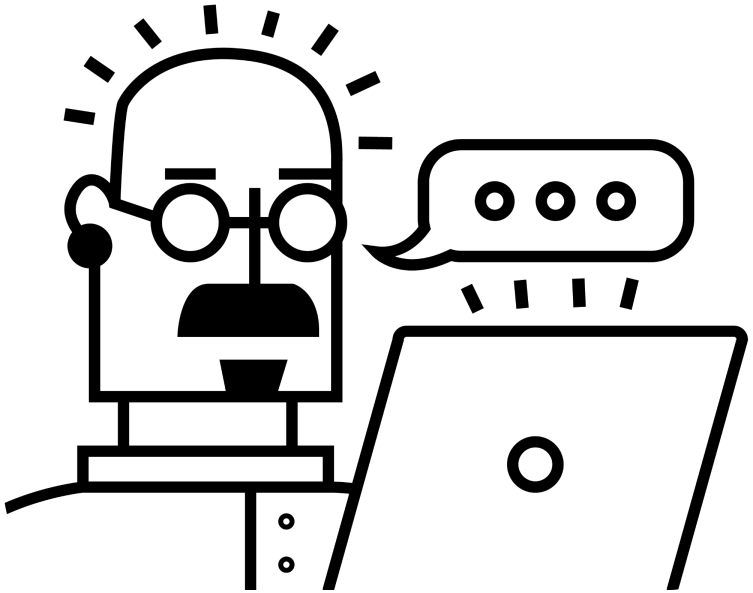
Wait, but machine translation exists!

We do have **machine translation** already, and it has gotten a lot better in recent years. But it's still **barely tolerable and generally unreliable** in most languages, including most CEE languages.

The **statistical approach** used by MT *barely understands context*, and therefore flattens nuances, registers, dialects, *even language barriers!* While we all use MT for what it's good for -- getting the gist of a text we cannot read on our own -- there are lots of uses **it is unsuitable for**.



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So, language is complex!

- Words have many forms; some irregular (go vs. went) / archaic (thou, dost)
- Words have many senses; some defunct (nice) / regional (lagniappe)
- Senses have many words -- synonyms (peak/summit, clever/smart)
- Homophones (steal vs. steel), homographs (read vs. read)
- Dialectal grammar ("I done saw")
- Register and period ("Hark!"; "Listen!"; "Hey!")
- Lexical overlap and confusion (what soda/pop, doubt, or fanny mean depends on where you live and whom you are speaking to)
- ...and all this is just at the lexeme level, leaving out the world of complexity that is **syntax**!

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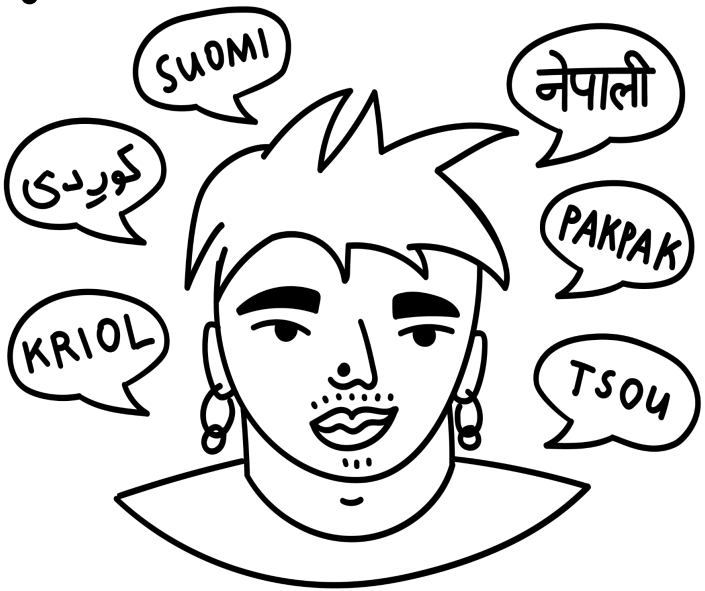
So... it's going to be complex to model as structured data, no?

Yes. :)

But it is really worth it! Because a vast amount of uses will be made possible once we have richly-modeled and linked data about our languages.

Here are just a few prospects. There are others I can think of, and, even more excitingly, still others I *can't even* think of!

And there are cool tools!



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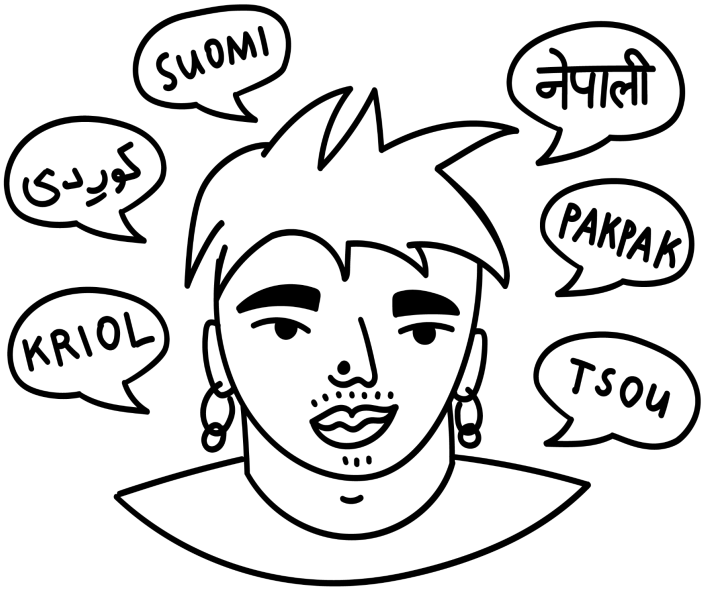
Language acquisition

Structured data about language allows the creation of **language acquisition** software, including:

- flashcard apps
- grammar practice (noun/adjective declension, verb conjugation)
- educational games
- pronunciation practice
- text-reading software with hyper-annotated text (for each word, form and sense analyzed)
- ...and more!



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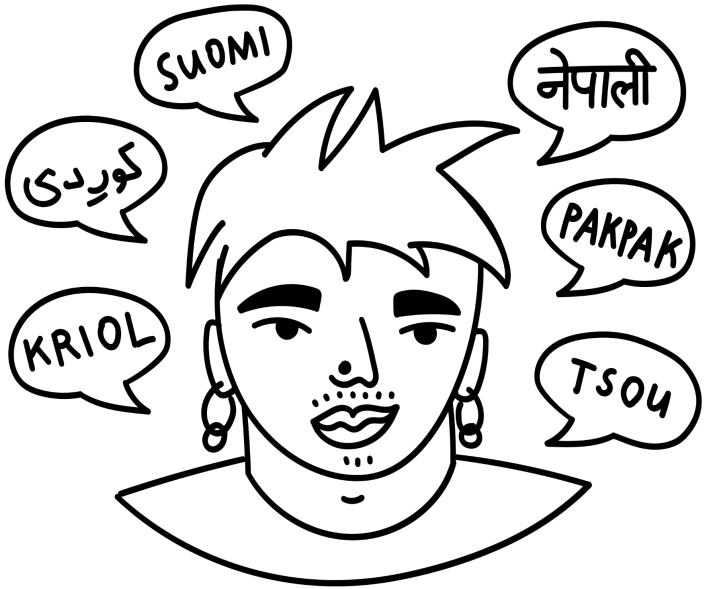
Language analysis

Structured data about language allows the creation of **language analysis and improvement** software, including:

- sophisticated spelling/grammar checkers
- crossword solvers
- etymological exploration/research
- stylometry
- stemmatology and phylometry
- ...and more!



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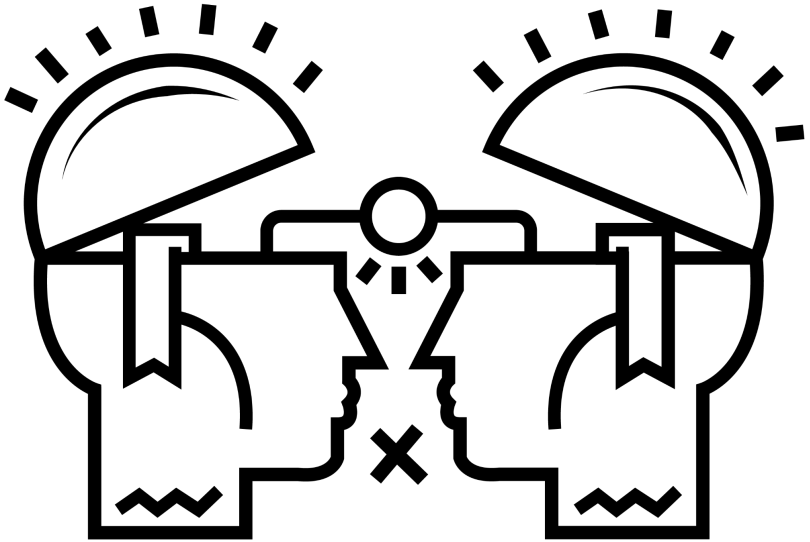
Translation

Correct and adequate translation depends on many factors:

- distinguishing the particular **sense** of the original word/phrase
- contextualizing (genre, register, voice, audience)
- selecting adequate word/phrase in target language, given and preserving the context
- …which is often quite far from a literal word-for-word substitution.



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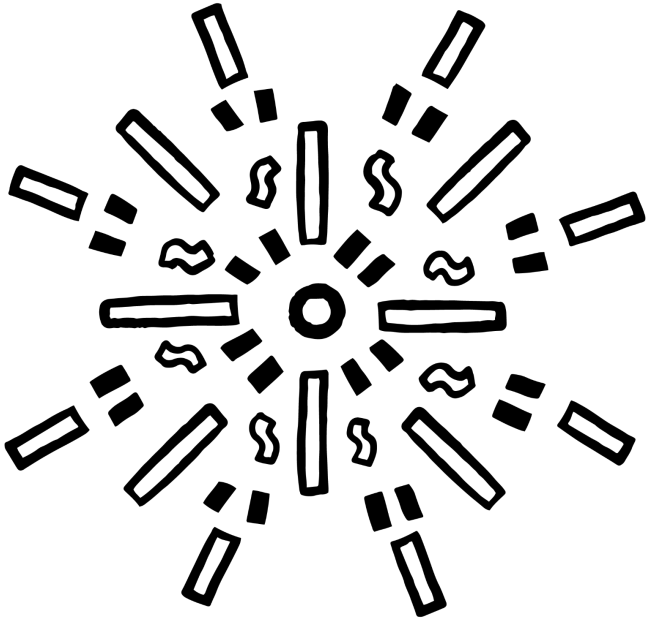
Let's wish upon a star…

What if we had a way to describe lexemes *very precisely*, down to specific **forms** and **senses**?

- To note that *this* form is *nominative* and *this* one *genitive*; this one *imperfect* and this one *pluperfect*?
- To note that a particular form is *regional*, or *archaic*, or *slang*?
- That *one* sense of this lexeme translates into *this* word in German, but *another* sense of this same lexeme translates into *this other* word in German?



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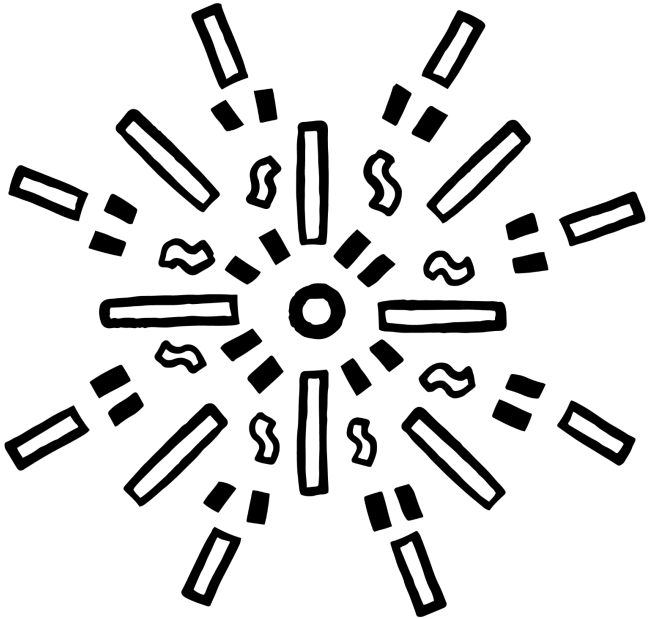
Let's wish upon a star…

That this lexeme **combines** three other lexemes?
That it is **derived** from another lexeme? That it is **borrowed** from another language?
That it denotes *this concept*, which has a (language-independent) Wikidata **item**?

What if we could provide real **example sentences** demonstrating the usage of *each sense* of the lexeme in real texts?

What if we could attach **audio** to each form showing how native speakers **pronounce** it? (Perhaps in more than one way!)



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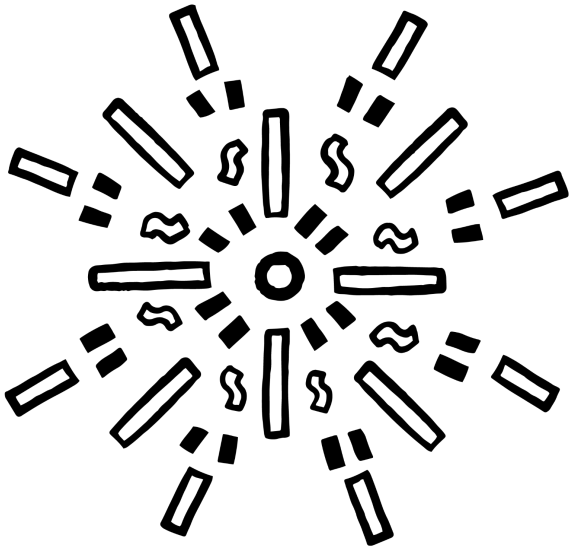
Let's wish upon a star...

What if we could **query** all this, and ask questions like:

- What are some nouns that are masculine in Ukrainian but feminine in German?
- What is the etymological graph of Slavic words for 'horse'?
- What is the longest word in our language without repeating letters?
- What percentage of our language's lexemes have we borrowed from which languages?
- What are some 'false friends' between our language and another? (e.g. Gift in English vs. German)
- How has this lexeme changed in usage over the years, based on actual texts?



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Guess what?

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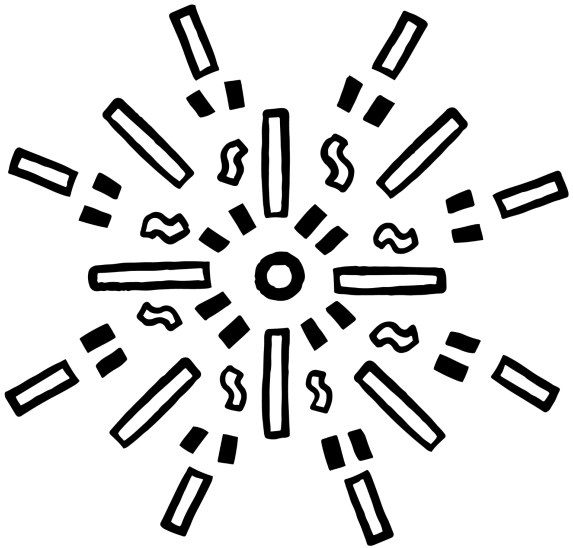
Lexeme can do this right now!

In fact...

Wouldn't it be nice if everyone could speak *your language*?

Until that happens, wouldn't it be nice if we could benefit *in our language* from content written by people who don't speak our language at all, *automagically*?

(o_O)



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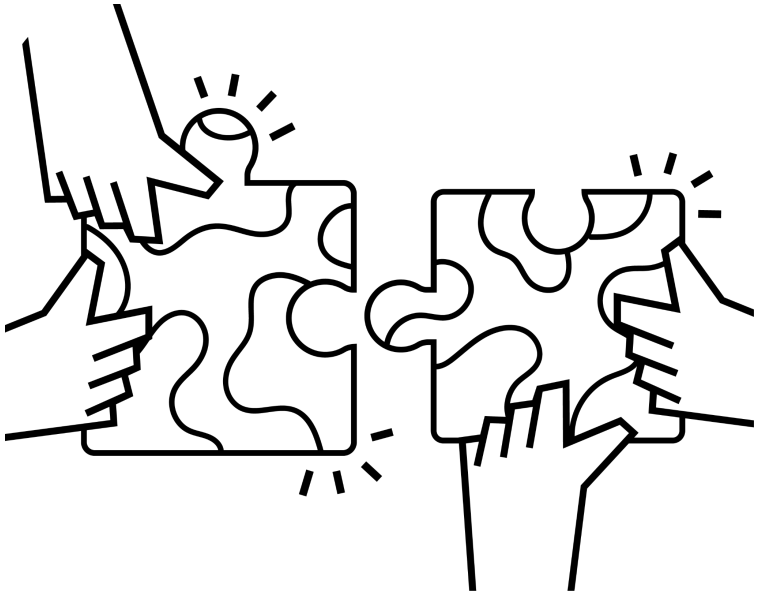
In fact...

Have you heard of **Abstract Wikipedia**? It's going to allow creating "abstract" articles *using code* (programming), from which we could then *generate* human-readable, grammatical, *and accurate* articles *in any language*!

Any language? Well, any language that is *well-described in structured data*!

Lexeme is fundamental to Abstract Wikipedia and to **vast** enrichment of content available in your language!



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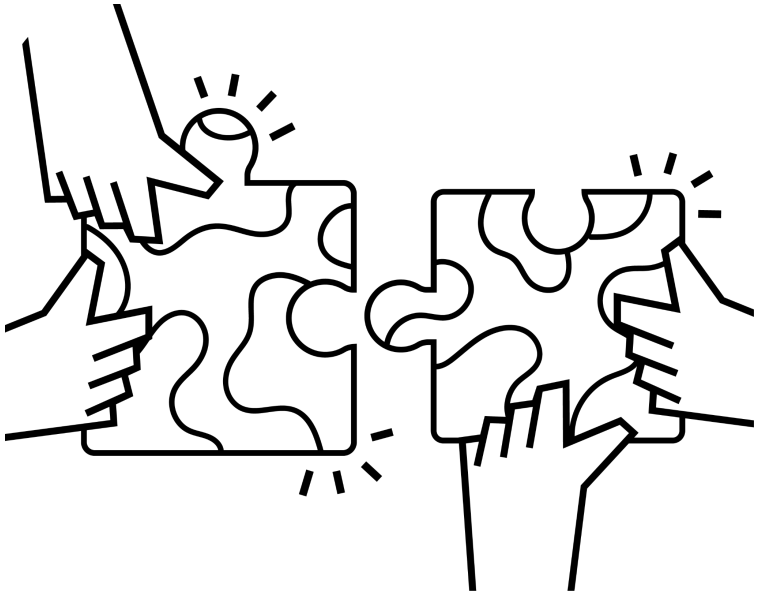
But what *is* Lexeme, exactly?

- It's a **lexicographical layer** on top of the **Wikibase** software running in the **Wikidata** project. "Lexeme" is shorter. :)
- Lexemes are Wikidata entities that exist in parallel to items. **Items ≠ Lexemes**. Items look like **Q212**; Lexemes look like **L34336**.
- We get all the benefits of the wiki; we link into Commons, Wikidata.
- We can use the Wikidata Query Service to query Lexemes (and even Lexemes and items).
- It is a (still) small, friendly, welcoming community



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Wiktionary?

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In short:

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Lexeme is

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02 A tour of Lexeme

Anatomy and sociology of a lexeme

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Let's take a look at a lexeme:

https://www.wikidata.org/wiki/Lexeme:L4177

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Okay, okay, Lexeme is worthwhile!

...

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But we have lots of questions!

...

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Such as: how do I know what already exists in my language?

...

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03 Browsing Lexeme

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- Ordia
- Hangor
- Lexical coverage report
- …?

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04 Contributing to Lexeme

Creating a Lexeme

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1. Lexeme Forms tool (+your lang? +gadget)
2. Orthohin tool (+your lang? +gadget)
3. Entity-suggester script (e.g. L475401)
4. MachtSinn tool -- connect lexemes to items
5. LinguaLibre record pronunciations! (query)
6. Lexeme Party improve by topic (+weekly)
7. Bodh tool -- tabular editing of lexemes.
8. Lexicator tool -- careful mass import from Wiktionary

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05 Querying Lexeme

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- Learn SPARQL
- ~~Steal~~Adapt queries

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06 Fun with Lexeme

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- Der, Die, Das
- Він, вона, воно
- ...?

Many more are yet to be invented! :)

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07 Next steps

How do we put our Lexeme hipsterism into action?

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These are early days!

1. We're figuring things out
2. Your input matters!
3. Take initiative; don't wait
4. Ask, discuss, invite

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What can you do now?

1. Explore Lexeme on your own
2. Add new lexemes
3. Add new forms, senses, examples to existing lexemes
4. Show Lexeme to your peers

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Ideally, lead lexeme adoption in your language!

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1. Check coverage of your lang
2. Start a WikiProject!
   - tutorials
   - to-do lists / queries
   - off-wiki channels

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Thank you for your attention!