NatACN
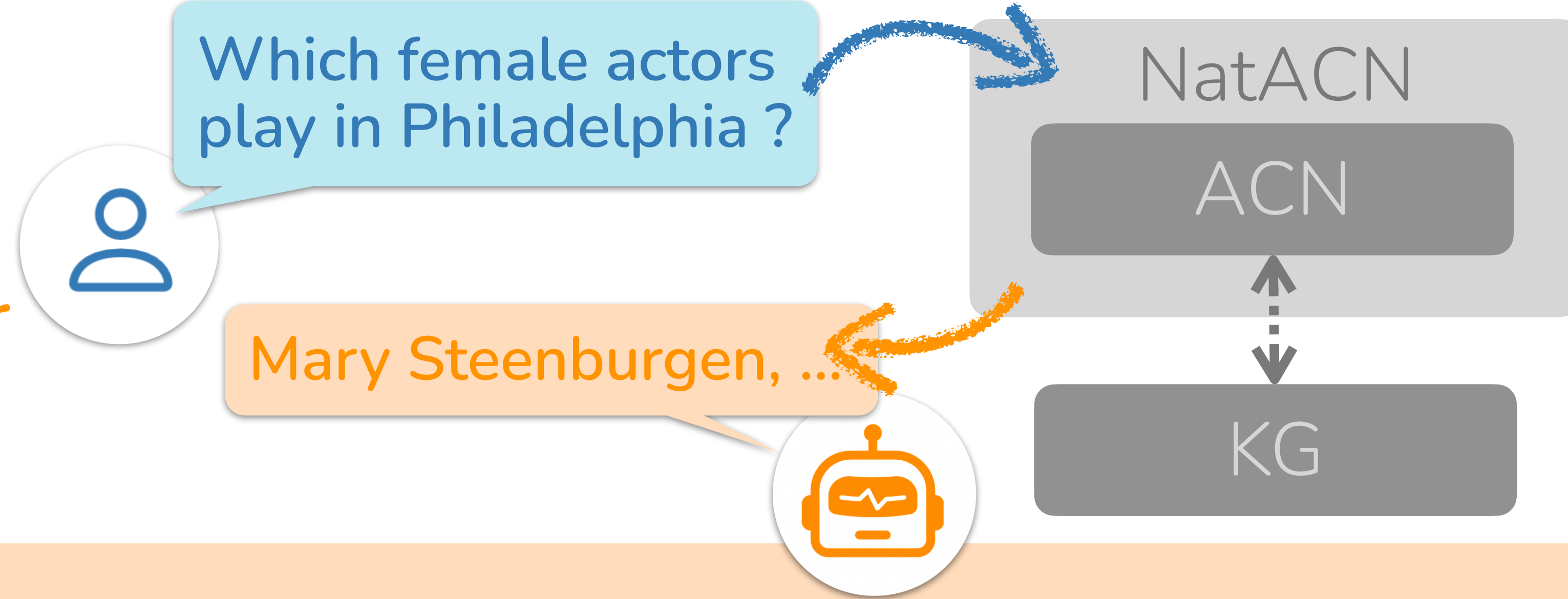**a natural language interaction system**

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Which female actors play in Philadelphia ?

NatACN
ACN
KG

Mary Steenburgen, …

Related Works:

Dialogue systems (DS):
[Deriu et al., 2020] **+ + − −**

DS →
- QA interactive → Interactive
- ~~Task Oriented~~ → Contextual
- ~~Conversational~~ → ~~Simple turn~~
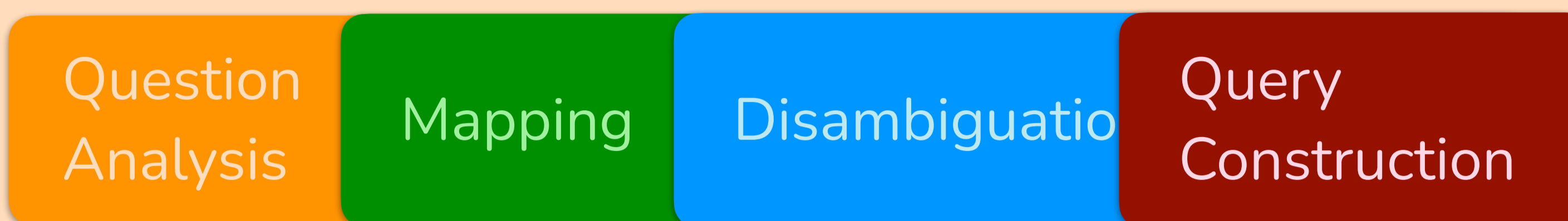
Controlled Language (CL), Query Builder (QB): **+ + − −**

SWiPE[Atzori et al., 2012]
CANaLI[Mazzeo et al., 2016]
Sparklis[Ferré, 2014] …

Question answering (QA): **+ −**
[Diefenbach et al., 2018]

Question Analysis	Mapping	Disambiguation	Query Construction

Spontaneity for user
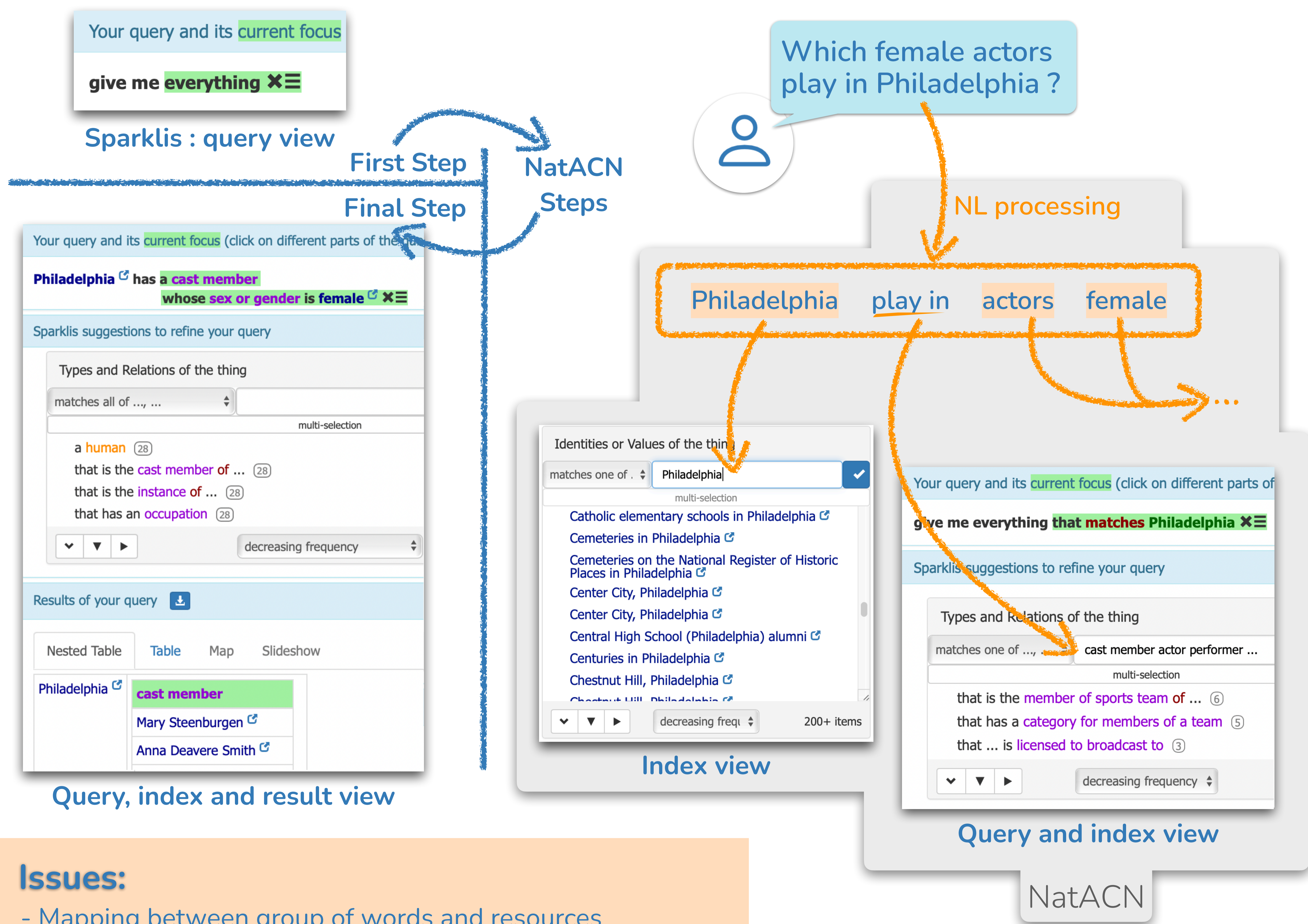**Result accuracy**

Objectives:

Create a <u>natural language (NL) interaction</u> system which pilots an <u>ACN system</u> over a knowledge graph to explore it. Then:

○ ACN improves accuracy   < QA | DS
○ NL improves spontaneity   < QA | CL/QB

Definition:

ACN system: interaction system for guided query building: e.g., Sparklis

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Your query and its current focus

give me everything ✖ ≣

Sparklis : query view

First Step
Final Step

NatACN Steps

Your query and its current focus (click on different parts of the …)

Philadelphia ⬈ has a cast member whose sex or gender is female ⬈ ✖ ≣

Sparklis suggestions to refine your query

Types and Relations of the thing

matches all of …, …

multi-selection

- a human ⟨28⟩
- that is the cast member of … ⟨28⟩
- that is the instance of … ⟨28⟩
- that has an occupation ⟨28⟩

⌄ ▼ ▶   decreasing frequency

Results of your query ⬇

Nested Table	Table	Map	Slideshow

Philadelphia ⬈	cast member
	Mary Steenburgen ⬈
	Anna Deavere Smith ⬈

Query, index and result view

Which female actors play in Philadelphia ?

NL processing

Philadelphia   play in   actors   female   …

Identities or Values of the thing

matches one of . … | Philadelphia| ✔

multi-selection

- Catholic elementary schools in Philadelphia ⬈
- Cemeteries in Philadelphia ⬈
- Cemeteries on the National Register of Historic Places in Philadelphia ⬈
- Center City, Philadelphia ⬈
- Center City, Philadelphia ⬈
- Central High School (Philadelphia) alumni ⬈
- Centuries in Philadelphia ⬈
- Chestnut Hill, Philadelphia ⬈
- Chestnut Hill, Philadelphia ⬈

⌄ ▼ ▶   decreasing freq   200+ items

Index view

Your query and its current focus (click on different parts of …)

give me everything that matches Philadelphia ✖ ≣

Sparklis suggestions to refine your query

Types and Relations of the thing

matches one of …, … | cast member actor performer …

multi-selection

- that is the member of sports team of … ⟨6⟩
- that has a category for members of a team ⟨5⟩
- that … is licensed to broadcast to ⟨3⟩

⌄ ▼ ▶   decreasing frequency

Query and index view

NatACN

Issues:

- Mapping between group of words and resources
  - "**Date of birth**"   `dbo:birthdate`
  - "**German** "   `dbo:country / dbr:Germany`
- Insertion Order of words in Sparklis (complex question)
  - Taking into account syntax
  - Implicit steps to add (e.g., focus change)
  - Combinatorial problem

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