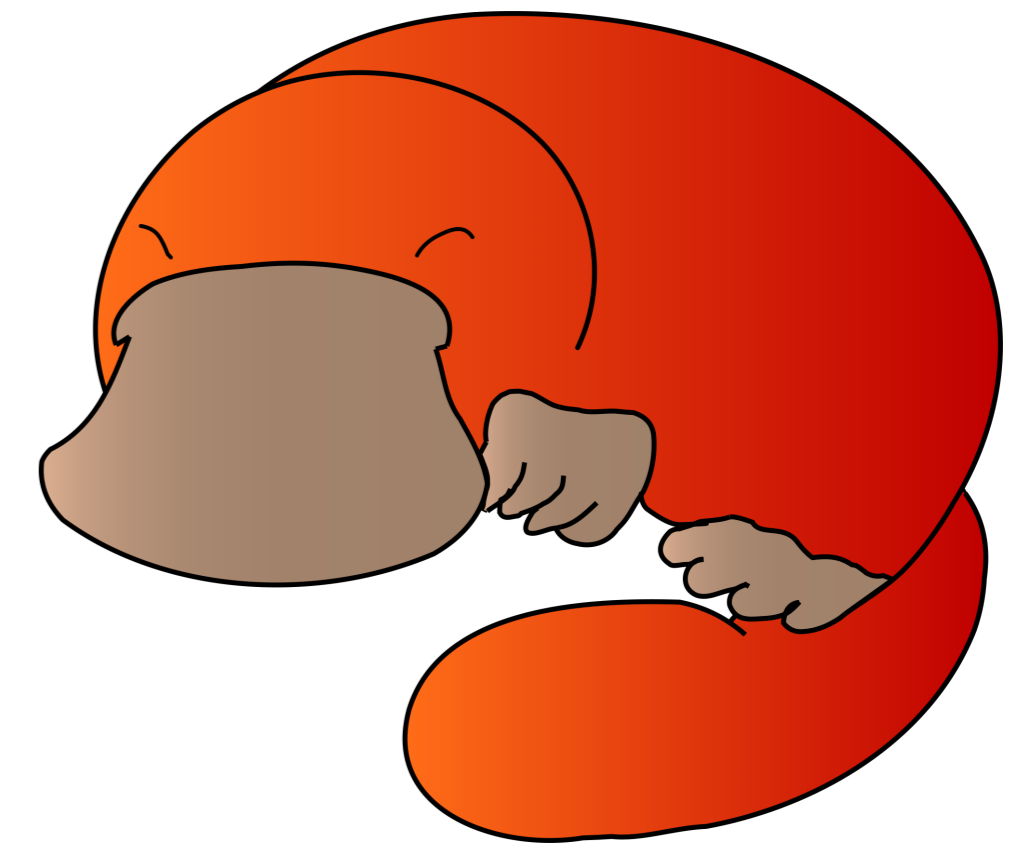


Platypus

a question answering tool

Raphaël CHARRONDIÈRE, Marc CHEVALIER, Quentin CORMIER, Tom CORNEBIZE,
Yassine HAMOUDI, Valentin LORENTZ, Thomas PELLISSIER TANON

ENS de Lyon and Lexistems SAS



<https://askplatyp.us>

Introduction

Platypus is a question answering tool in natural language. It is able to answer questions like "When was the inventor of dynamite born?". It is based on Wikidata and is available in French, English and Spanish at askplatyp.us.

Examples

Some question/answer examples:

Where was the inventor of dynamite born? Stockholm

Who is the CEO of Google? Sundar Pichai

Who is the author of Fondation? Isaac Asimov

Where are the Alps? map showing the Alps location

Who are the children of the wife of Barack Obama? Malia and Sacha Obama

What is the population of France? 66M

Give me the father of Barack Obama: Barack Obama Sr.

Who is the mayor of Paris? Anne Hidalgo

What is the atomic number of Polonium? 84

sqrt(2+2): 2

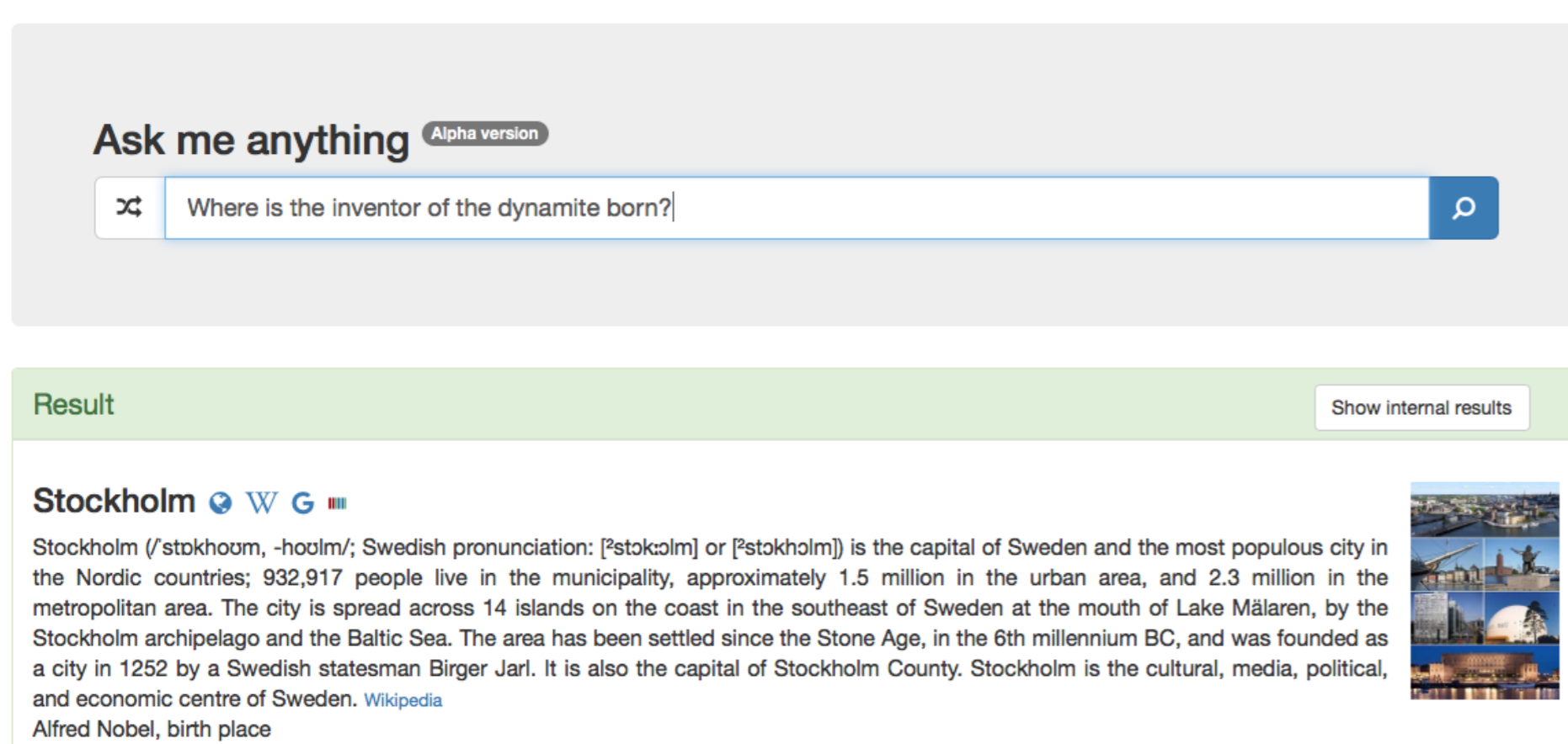


Figure 1: Demo interface

It is also able to generate SPARQL request to be executed with query.wikidata.org:

Who are Wikidata's developers?

```
SELECT DISTINCT ?result WHERE {  
  wd:Q2013 wdt:P178 ?result .  
} LIMIT 100
```

Who is the wife of the president of France?

```
SELECT DISTINCT ?result WHERE {  
  ?result wdt:P26 ?arg . wd:Q142 wdt:P35 ?arg .  
} LIMIT 100
```

How does it work?

Platypus is split in different components that are:

Platypus QA: main component that does question analysis

Platypus KB: knowledge base that is synchronized with Wikidata and provides an API allowing Platypus QA to do queries not supported by the Wikidata API

CoreNLP: grammatical analysis toolkit <http://stanfordnlp.github.io/CoreNLP/>

Spacy: grammatical analysis toolkit <https://spacy.io>

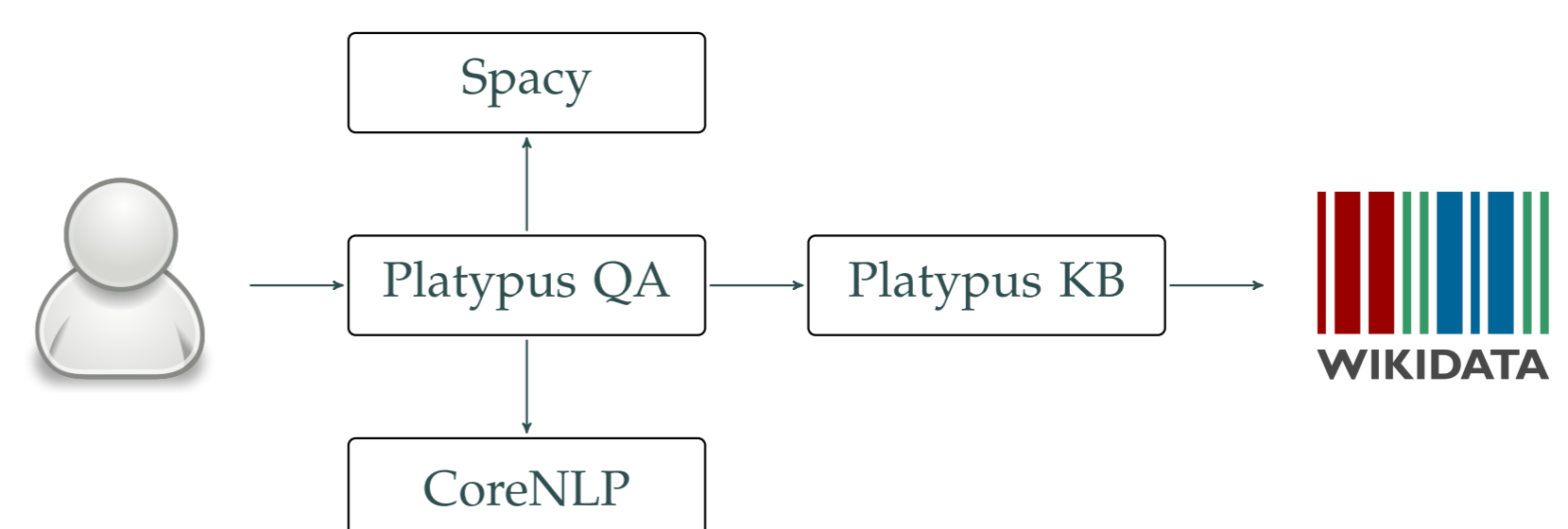


Figure 2: Platypus architecture

"Where is the inventor of dynamite born?"

grammatical analysis (CoreNLP or Spacy)

1	Where	ADV		PronType=Int	0	ROOT
2	is	VERB	Mood=Ind—Number=Sing—Person=3—Tense=Pres—VerbForm=Fin	1	cop	
3	the	DET	Definite=Def—PronType=Art	4	det	
4	inventor	NOUN	Number=Sing	1	nsubj	
5	of	ADP		6	case	
6	dynamite	NOUN	Number=Sing	4	nmod	
7	born?	PUNCT		1	punct	

semantic analysis (PlatypusQA or PlatypusKB)

$\{x \mid \exists y \text{ placeOfBirth}(y, x) \wedge \text{inventor}(\text{dynamite}, y)\}$

SPARQL query building (PlatypusQA)

```
SELECT ?x WHERE { wd:Q80728 wdt:P61 ?y . ?y wdt:P19 ?x }
```

query execution and results display (Wikidata and PlatypusQA)

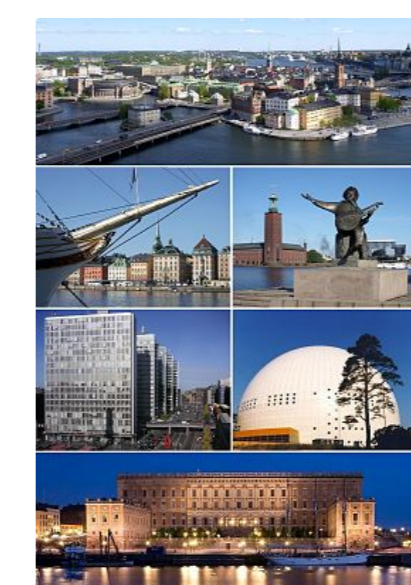


Figure 3: Question execution

