

# POS Question Answering

KG Miniproject

SurniaQA

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## Approach - Question Preprocessing

*"What is the language of france ?"*

# CoreNLP

WP VBZ DT NN IN NN .

Fox

[<<http://dbpedia.org/resource/France>>]

R1

## DBOIndex

[<http://dbpedia.org/ontology/lanugage>, ...]

01

## Representation of Question-Tokens

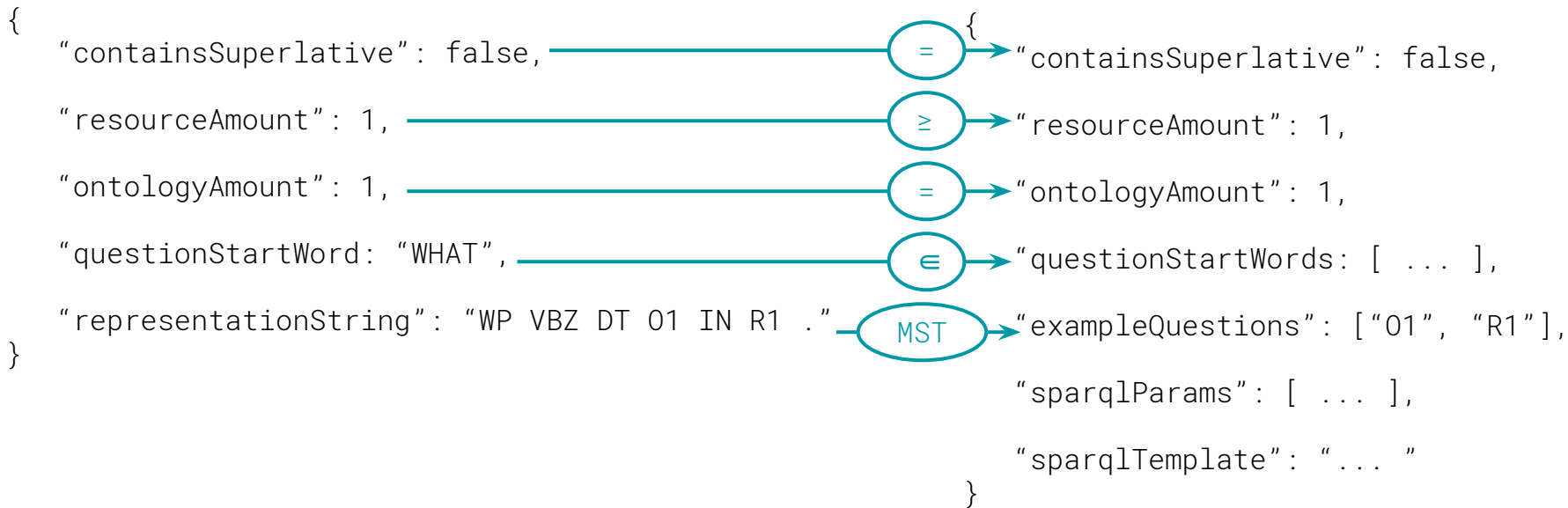
WP VBZ DT 01 IN R1 .

# Approach - Template Matching

*"What is the language of france ?"*

Extracted question properties:

Predefined template properties:



# Approach - Query Generation

*"What is the language of france ?"*

WP VBZ DT O1 IN R1 .

R1: [<<http://dbpedia.org/resource/France>>]

O1: [<<http://dbpedia.org/ontology/lanugage>>, <...>, <...>, ...]

{

... ,

"sparqlParams": [ "O1", "R1" ],

"sparqlTemplate": "SELECT DISTINCT ?x WHERE { ?R1 ?O1 ?x . }"

}

⇒ Generate combinations for parameter replacement for all fitting templates to create queries

# Evaluation - Method

- Used Benchmarking platform for Question Answering Systems:

*GerbilQA*



- Used Dataset for evaluation:

*QALD-7-Train-Multilingual*

214 questions in several languages that can be answered with DBpedia

# Evaluation - Results

	Micro F1	Micro Precision	Micro Recall	Macro F1	Macro Precision	Macro Recall	Avg. millis/doc	Macro F1 QALD
	0.420	0.030	0.068	0.092	0.091	0.108	764.883	0.192
Answer Type	0.324	0.933	0.196	0.200	0.200	0.200		
C2KB	0.214	0.578	0.130	0.161	0.163	0.164		
P2KB	0.140	0.382	0.086	0.120	0.111	0.113		
RE2KB	0.116	0.316	0.071	0.096	0.096	0.100		

# Discussion of the approach

## Strengths

- Really fast
- Extendible by adding other/more queries to the JSON file
- Small Web Service and all big external dependencies are used via REST  
⇒ Perfect as a Microservice

## Weaknesses

- DBOIndex finds a lot of unrelated Ontology properties and often not the needed one  
⇒ Many SPARQL queries are generated and have to be tested
- (Currently) No support for queries which uses literals from the question

# Possible Improvements of the approach

- Improve property matching to DBpedia Ontology by either:
  - Search for a better library and replace DBOIndex
  - or find a better algorithm for filtering DBOIndex results and add handcrafted mapping for properties DBOIndex does not find
- Decide on parameter replacement based on the position in the question and not on the order of the found resources and properties
- Add replacement of literals in the SPARQL Templates to support more types of questions
- Don't stop when the first Query gets a result but collect more results to validate and find the best answer



# Code and Documentation

Repository:



<https://github.com/Berberer/SurniaQA>

Documentation:

- Code commentary
- Explanations in README.md
- docs-Directory with this Presentation and generated Javadoc

# Task distribution

**Burhan**

**Lukas**

Approach planning

CoreNLP

Fox & DBOIndex

SPARQL Templates

Query Matching

Evaluation

Presentation and  
Documentation