Question Answering and Chatbots

3rd Practical exercise – Question Classification

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Text Classification Task

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Types of classification:

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Types of classification:

Binary	2 classes
Multi-class	$>$ 2 classes (typically)
Multi-label	a data item might have $\geq$ 1 class

Text or Question classification

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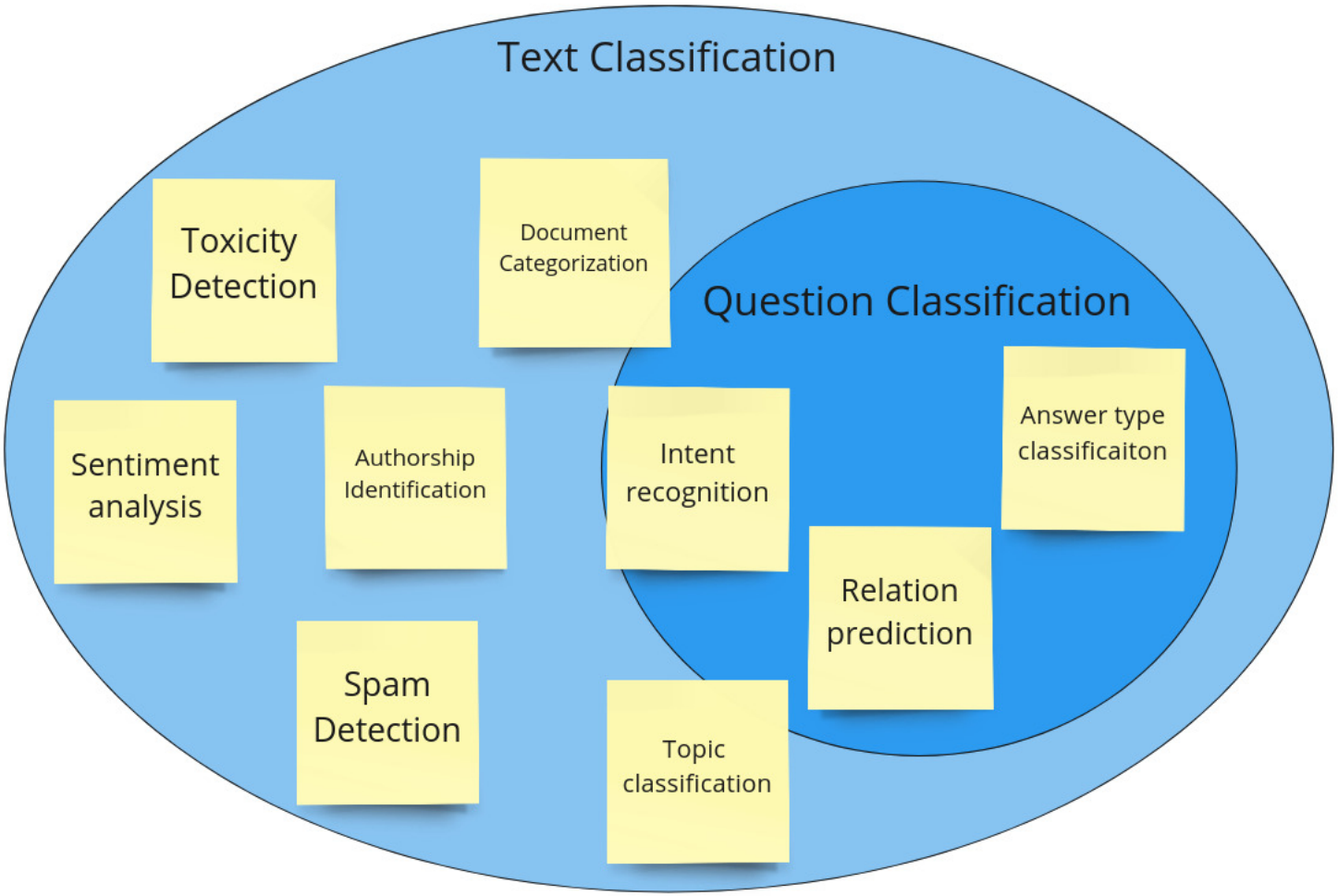

Question classification in QA

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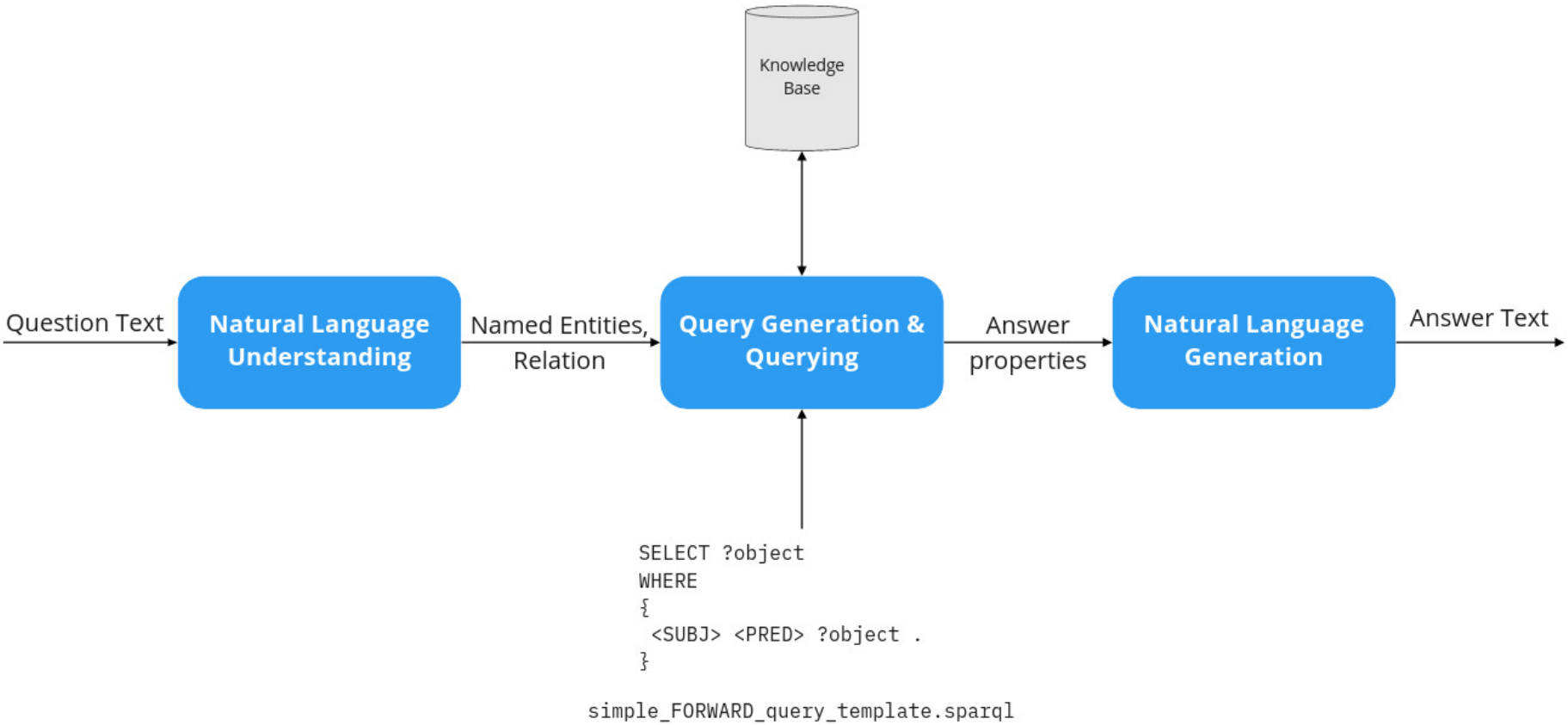

Figure: QA system architecture for "Simple Questions"

Any questions?

Text-to-vector transformation

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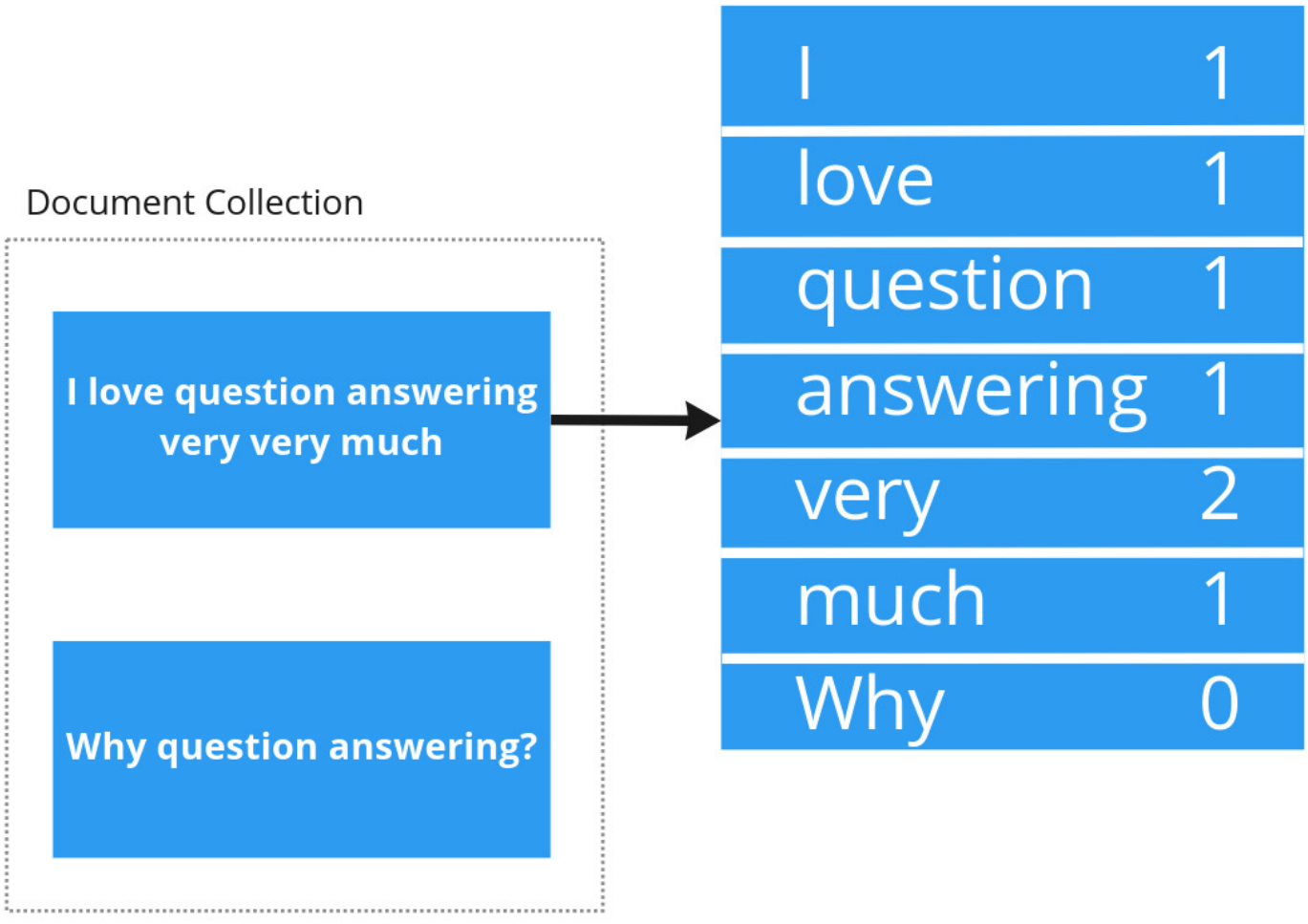
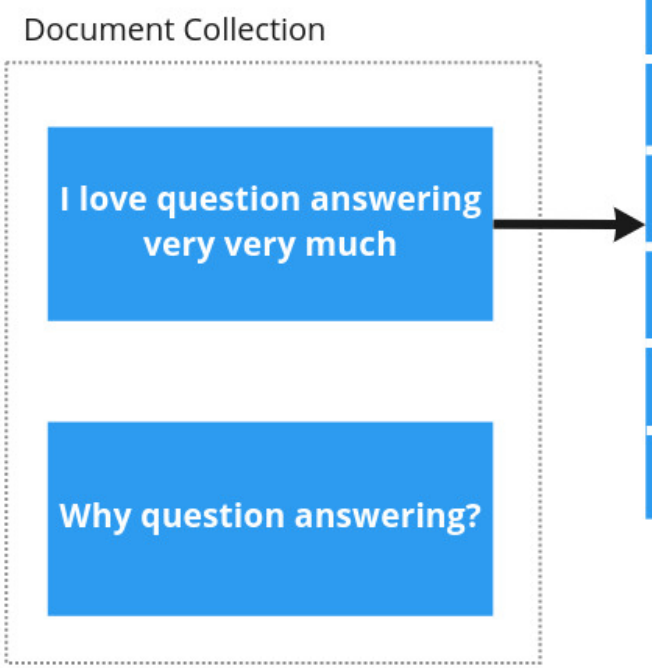
Bag of Words



Text-to-vector transformation

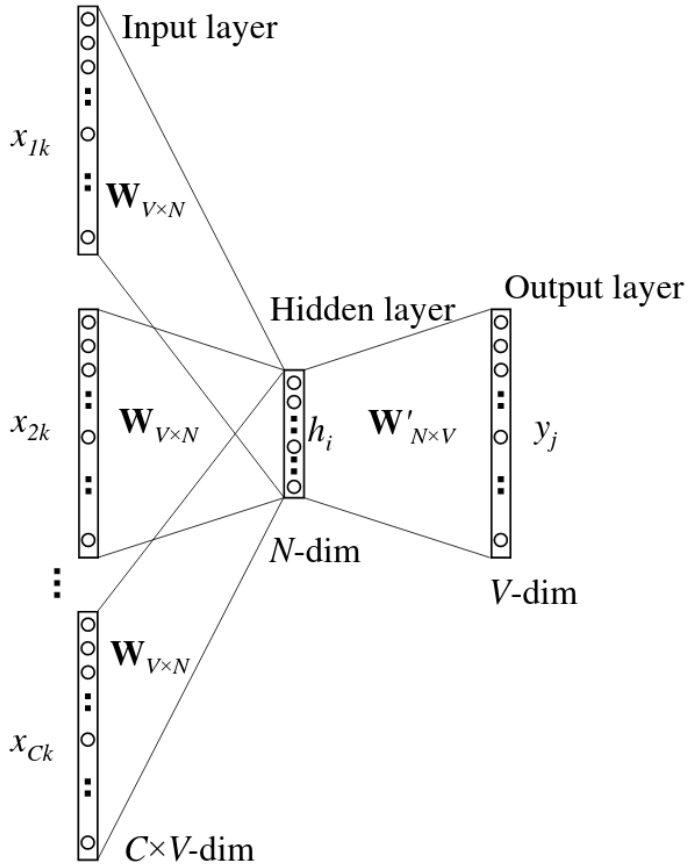
Term Frequency - Inverse Document Frequency (TF-IDF)



	TF	IDF	TFxIDF
I	1/7	log(2/1)	0.099
love	1/7	log(2/1)	0.099
question	1/7	log(2/2)	0.0
answering	1/7	log(2/2)	0.0
very	2/7	log(2/1)	0.198
much	1/7	log(2/1)	0.099
Why	0/7	log(2/1)	0.0

Text-to-vector transformation

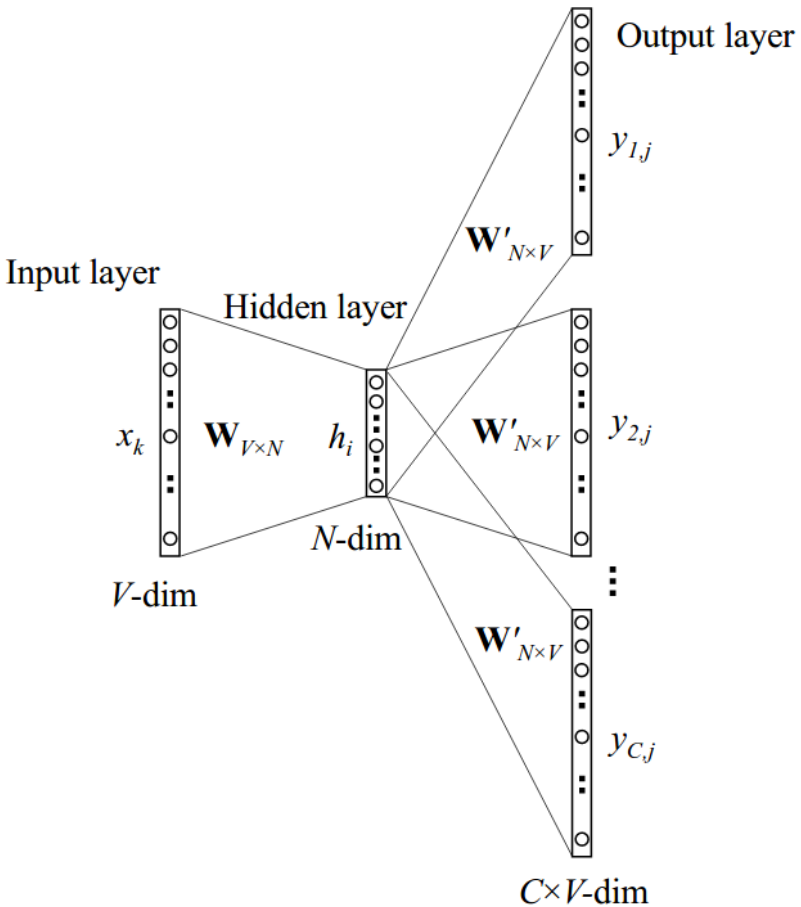
Word2Vec (2013) – Continious Bag of Words [1]



[1] `https://arxiv.org/pdf/1411.2738.pdf`

Text-to-vector transformation

Word2Vec (2013) – Skip-Gram [1]



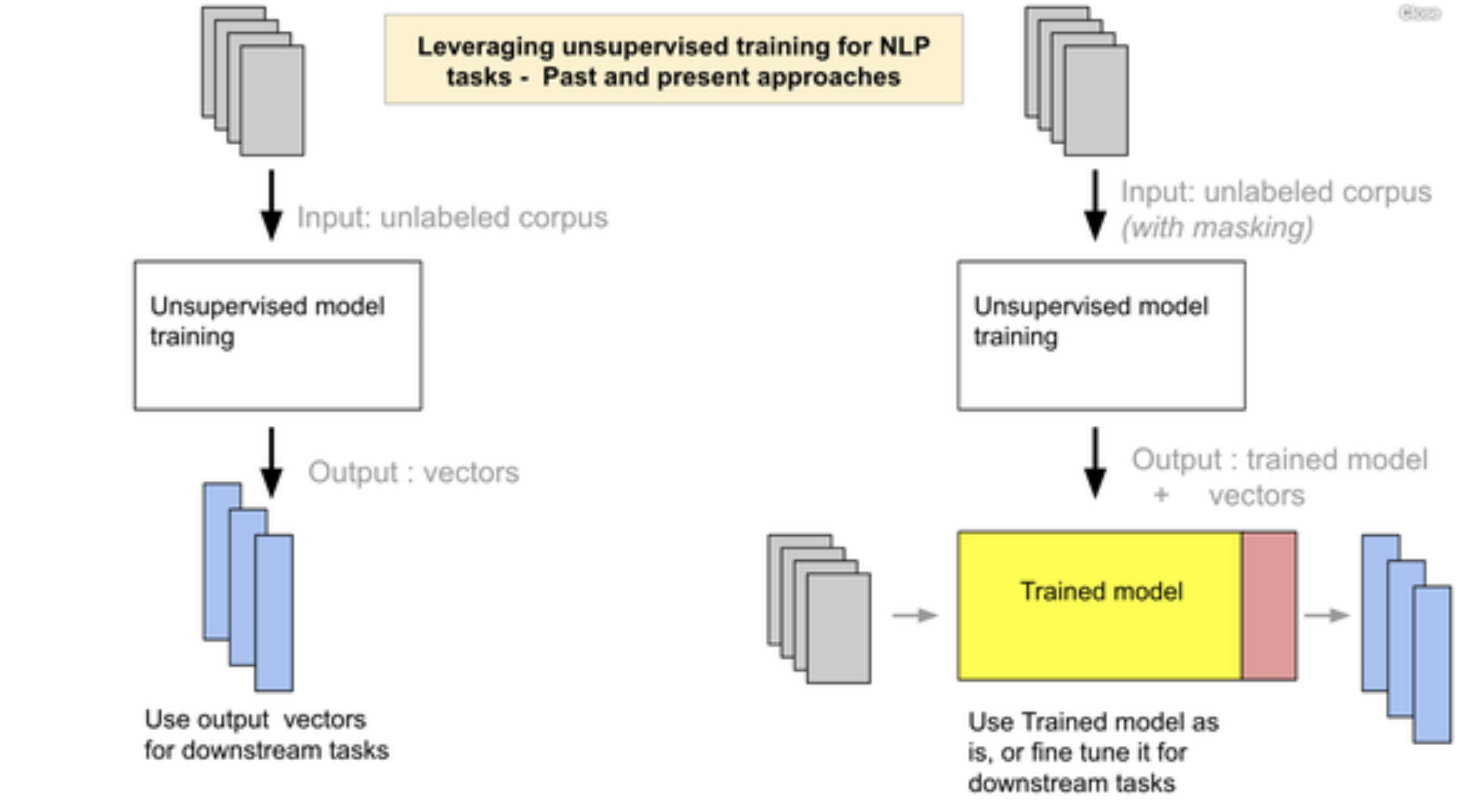
[1] https://arxiv.org/pdf/1411.2738.pdf

Text-to-vector transformation

fastText (2016) – Same as Word2Vec, but instead of words character n-grams are considered as an input.

For example the word vector “apple” is a sum of the vectors of the n-grams “ap”, “app”, ”appl”, ”apple”, ”apple”, “ppl”, “pple”, ”pple”, “ple”, ”ple”, ”le” (assuming hyperparameters for smallest ngram is 3 and largest ngram is 6).

Modern approaches



[2] https://www.quora.com/What-were-the-most-significant-Natural-Language-Processing-advances-in-2018

Let's do the exercise. Ask me if you have a question.

Plan for the Exercise 4: Back-end and Front-end

Task for TODAY: implement a Back-end and/or Front-end parts.

Back-end – is a Web-service which works as an API and implements 2 methods:

1. Type: GET, Name: health, Returns: "Hello World" string;
2. Type: POST, Name: get_answer, Params: question_text, Returns: "This is your question: **question_text**".

Front-end – can be developed as a web-page with chat window OR messenger's (Telegram, Whatsapp) API can be used.

Final goal – connect your Front-end with Back-end.

The complete task will be published in 1-2 days.

1. SPARQL;
2. Work with Natural Language (NER);
3. **Question classification**;
4. Back-end and Front-end;
5. Simple QA system;
6. Tests for QA system;
7. Docker;
8. Qanary Framework;
9. ...