

SML Question-Answering System for World History Essay Exams at NTCIR-13 QALab-3

Team : SML

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Our Target

Question Types

1. Multiple-choice question
2. Term question
3. Essay question
 - Long essay (in 450-600 characters)
 - Short essay (in 30-120 characters)

Tasks for Essay question

1. End-to-End task
2. Extraction task
3. Summarization task
4. Evaluation method task

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World History Short Essay

Question

ポリスの形成過程を、60字以内で説明しなさい。

Describe, in no more than 30 English words, the process by which the polis were formed.

(The University
of Tokyo, 2009)

Model Answer

各地で有力貴族の指導下で、集落が連合し、アクロポリスを中心として人々が集住する形でポリスを形成した。

Under the leadership of powerful nobles, various settlements formed coalitions, and people lived together around the Acropolis, forming poleis.

Phase2 results

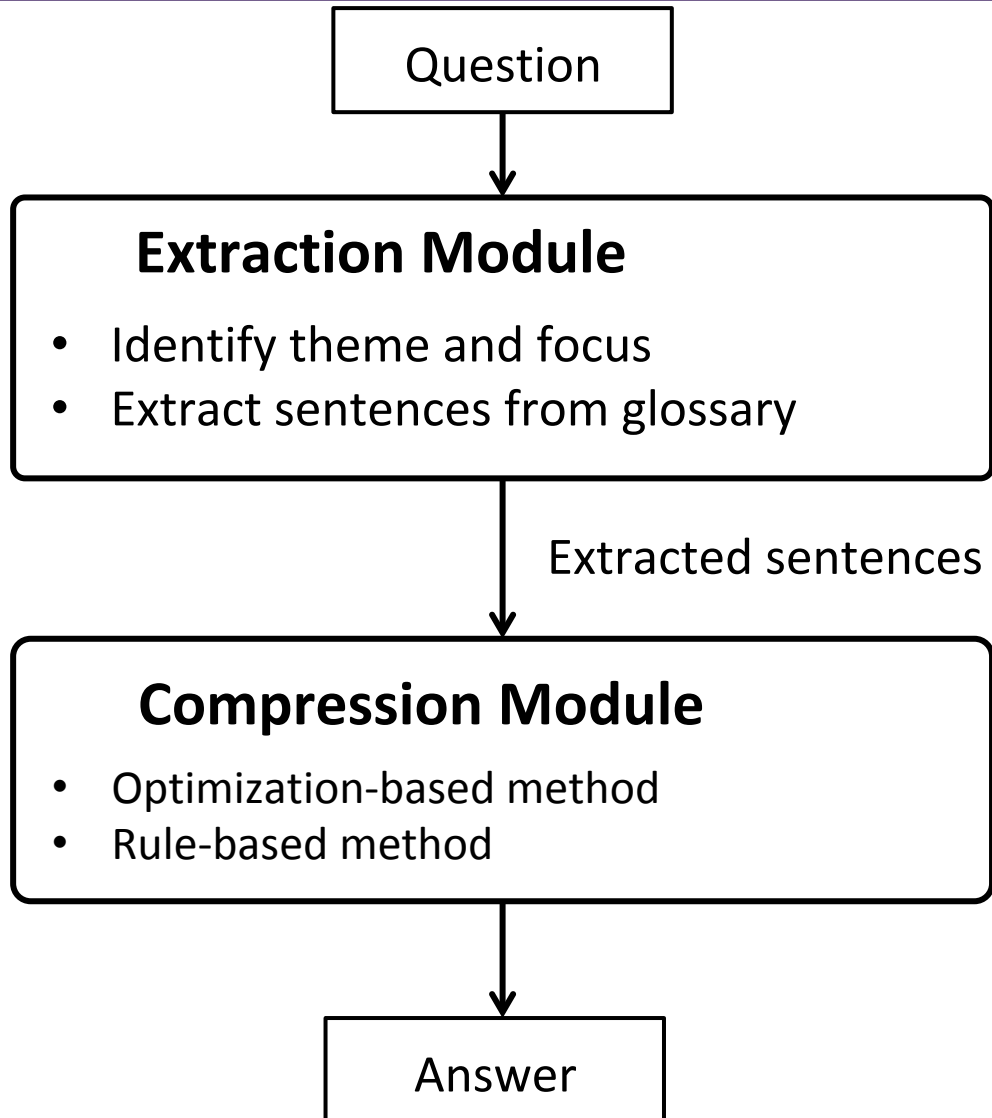
Number of short essay questions is 22

	Nuggets	ROUGE-1	ROUGE-2	ROUGE-3
Run-1	7 / 80	0.313	0.088	0.038
Run-2	7 / 80	0.312	0.091	0.039

All team's ROUGE-2 scores

1. Forst 0.107
2. **SML 0.091**
3. KSU 0.072
4. IMTKU 0.052

Our System



Extraction Module

Q. Describe, in no more than 30 English words, the **content** of the **Monroe Doctrine**.

Identify the **theme** and **focus** of question

Theme : Monroe Doctrine

Focus : Content



Monroe Doctrine

Definition

The Monroe Doctrine was a United States ...

Content

It stated that further efforts by European ...

➔ Extract

Content

At the same time, the doctrine noted that ...

➔ Extract

Compression Module

Optimization-based Method [Morita et al. 2011, 2013]

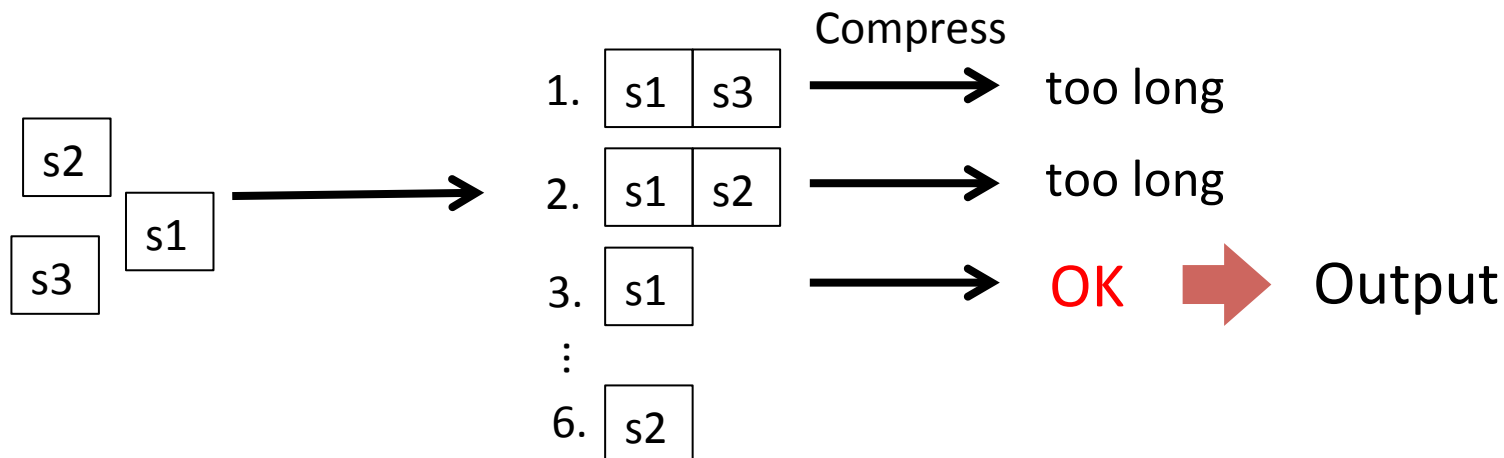
Repeatedly add valid subtrees to answer so that gain of objective function is maximized

$$\text{Objective function } f(S) = \sum_{w \in \text{words}(S)} \left(qsb(w) \sum_{i=0}^{\text{count}_S(w)-1} d^i \right) + \gamma \cdot \text{reward}(S)$$

qsb(w) : query relevance score

Rule-based Method

1. Extend extracted sentences by concatenating each pair
2. Sort sentences by QSB score
3. Compress sentence in turn by compression rules



Phase2 results

Run-1 Rule-based method

Run-2 Optimization-based method

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➔ There was no significant difference between the performances of two compression methods

Analysis

In **18/22** question, the extracted sentences included none of the nuggets

➔ In most cases, the theme was wrongly identified

e.g.

Q. During the middle of the Former Han era **Confucianism**, which up until that point had been merely one of several valid schools of thought, was given a special position of prominence, separate from other schools of thought. Explain, in 30 English words or less, what event led to this.

“Confucianism” was not extracted as **theme** because it didn’t match the rule for identifying theme

Summary

- We need to detect the theme more accurately.
- There was no significant difference between the performances of two compression methods.
- But the two compression methods may work differently when extraction module is improved.