

# Using Time Periods Comparison for Eliminating Chronological Discrepancies between Question and Answer Candidates at QALab NTCIR11 Task

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## Basic idea

To solve the Center Exams for world history in Japanese, our system firstly extracts time related phrases from questions and their answer candidates. Then the terms are compared from various viewpoints to the compared one. The candidate whose terms are the most consistent with each other is selected as most probable answer. There are a numerous viewpoints to find correctness of answer candidate, e.g. date, place, country, religion, etc. The NNLP team considered that dates of the terms are most important clue to solve an exam for history.

## Method

Our system focuses on dates within the terms from world history. The system checks up temporal overlaps between periods of terms in questions and their answer candidates. Incorrect candidates are likely to contain terms that do not overlap with other terms.

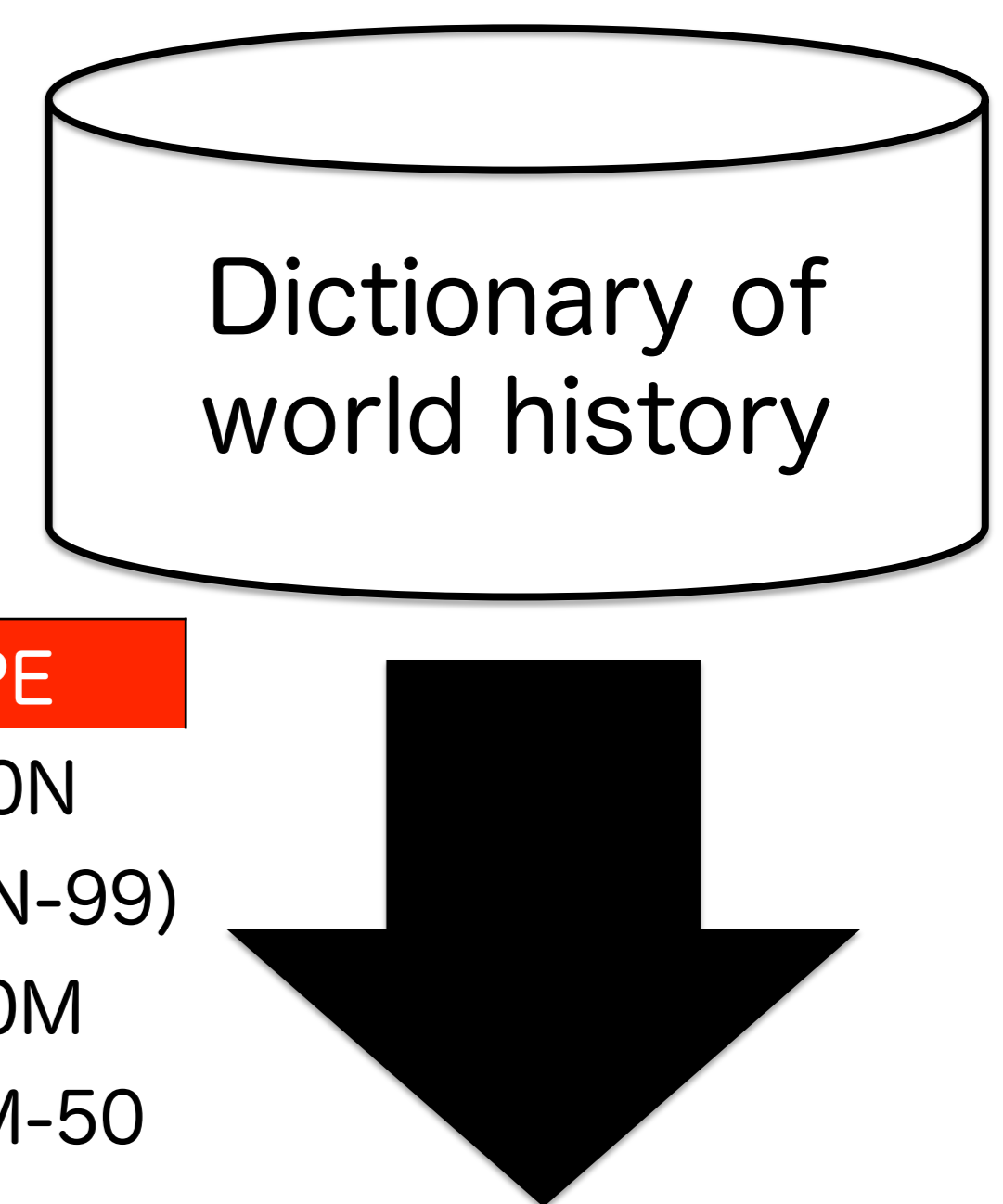
The dates related to most of the terms usually span over a period of several years, although some terms are events within a year. Therefore, we needed to specify the **Time Period Beginning point (TPB)** and the **Time Period Ending point (TPE)** of all applicable terms.

## Creation of annotated dictionary

We considered Dictionary of World History as a sufficient database since almost each term contains such information as "time period", "area" or "religion". However, the Dictionary of World History was not applicable as a database in a straightforward manner, since the date expressions are usually not plain numerical values, but time-related expressions, such as "9th century" and "10th century BC", etc. Therefore the NNLP team created a database which contains both TPB and TPE using the Dictionary of World History.

Raw data	TPB	TPE
1795,1806	1795	1806
1861,65	1861	1865
March, 1802	1802.16	1802.16
1838/39,97	1838/39	1897

Patterns	TPB	TPE
Nth century	100N-99	100N
Nth century BC	-100N	-(100N-99)
Nth century - M century	100N-99	100M
the firth half of Nth century	100N-99	100M-50



TERM	TPB	TPE	EXPLANATION	...
Tang dynasty	618	907		
Yan Zhenqing	709	786		
Song dynasty	960	1126		
Ouyang Xiu	1007	1072		
Wang Anshi	1021	1086		
Qin Hui	1090	1155		
Yuan dynasty	1271	1368		

問 1 下線部①に関連して、次に挙げる人物は、いずれも唐代から宋代にかけての科挙の合格者である。それぞれの人物について述べた文として正しいものを、次の①～④のうちから一つ選べ。

- ① 欧陽脩や蘇軾は、唐代を代表する文筆家である。
- ② 顔真卿は、宋代を代表する書家である。
- ③ 宋の王安石は、新法と呼ばれる改革を行った。
- ④ 秦檜は、元との関係をめぐり主戦派と対立した。

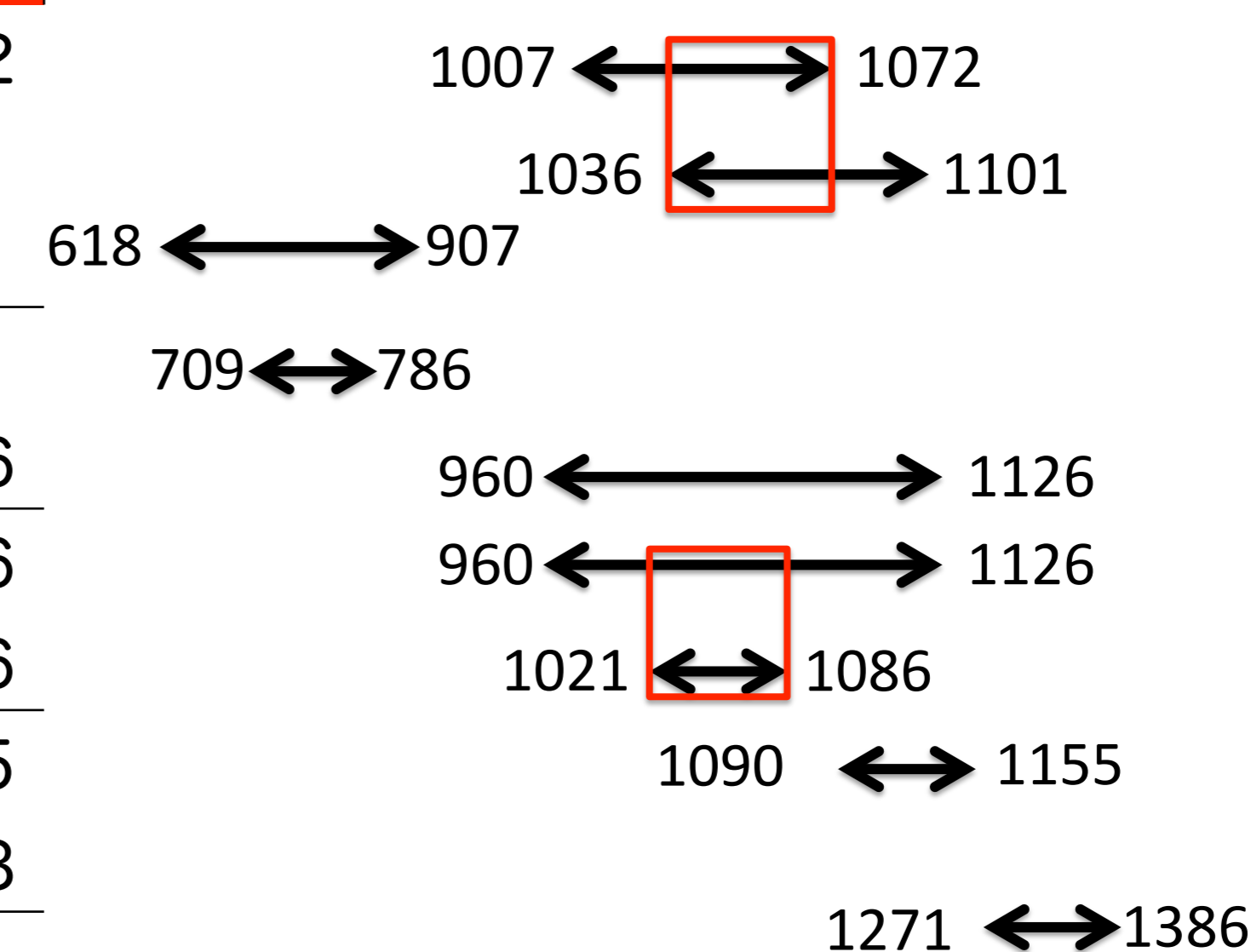
The underlined sentence of the question

"After Tang dynasty and Song dynasty, brilliant people which had cultural and artistic talents had passed the imperial examination."

### Candidates

- ① Ouyang Xiu and Su Shi are famous literary men in Tang dynasty.
- ② Yan Zhenqing is a representative calligrapher in Song dynasty.
- ③ Wang Anshi performed the reform called the new law in Song dynasty.
- ④ Qin Hui was is opposed to the main party in relation to Yuan dynasty.

TERM	TPB	TPE
Ouyang Xiu	1007	1072
Su Shi	1036	1101
Tang dynasty	618	907
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### Comparison of terms

- ① Partial agreement
- ② Disagreement
- ③ Agreement
- ④ Disagreement

## Results

Phase	Run ID	Question	Correct	Total Score	Correct answer rate
Phase1	Center-2007-Main-SekaishiB	36	11	31	0.3050
Phase2	Center-2003-Main-SekaishiB	41	7	18	0.1707

Exam ID	Question	Correct	Correct answer rate
Center-1997-Main-SekaishiB	40	10	0.2500
Center-2001-Main-SekaishiB	39	14	0.3590
Center-2005-Main-SekaishiB	36	7	0.1944
Center-2009-Main-SekaishiB	36	11	0.3056

## Conclusion

We created and applied a date identification method, which checks for temporal overlaps between time periods in questions and their answer candidates. In this paper, we introduced details of this method and analyzed the test results. When tested on the World History Dictionary that is used for preparing to the exams, our approach achieved 30% of correct answers in the 2007 Center Exam Task and 17% for the 2003 Center Exam Task.