

KitAi-QA : a Question Answering System for NTCIR-12 QALab-2

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Contents

- Outline of our system
- Methods in the system
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- Summary

Outline of KitAi-QA

- Solving the National Center Test

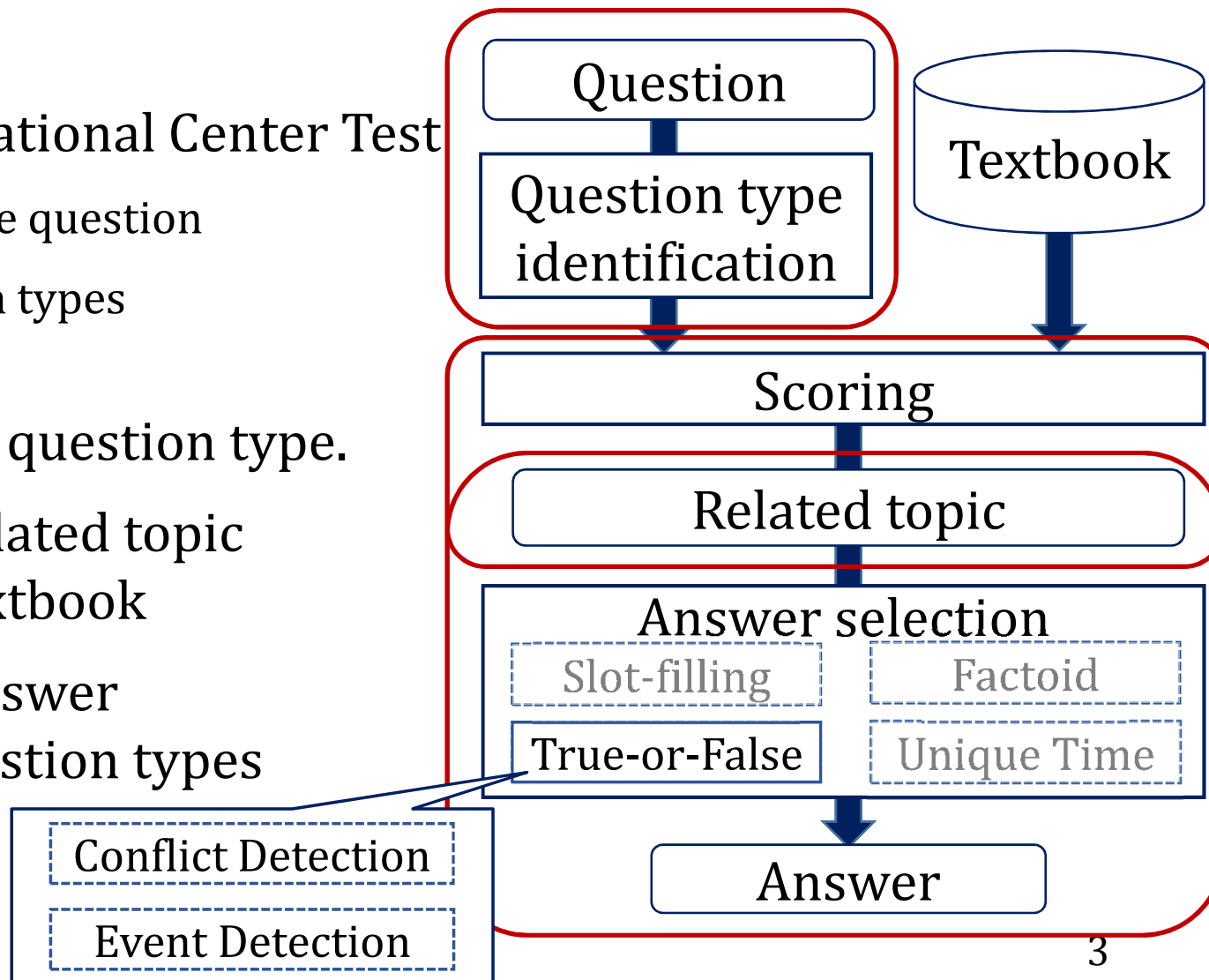
- Multiple choice question

- Some question types

1. Identify the question type.

2. Extract a related topic from the textbook

3. Select an answer for four question types

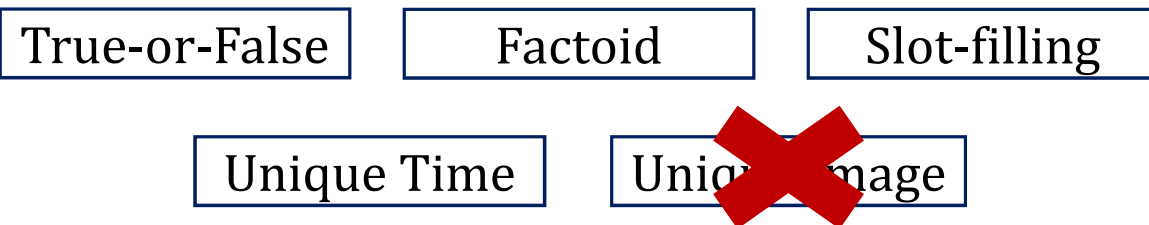


Conflict Detection

Event Detection

Question Type Identification

- Classify questions into five question types



- Key phrase-based rules

Question:

ヨーロッパの主要参戦国の状況を述べた

次の文 (following sentences)のうちから、

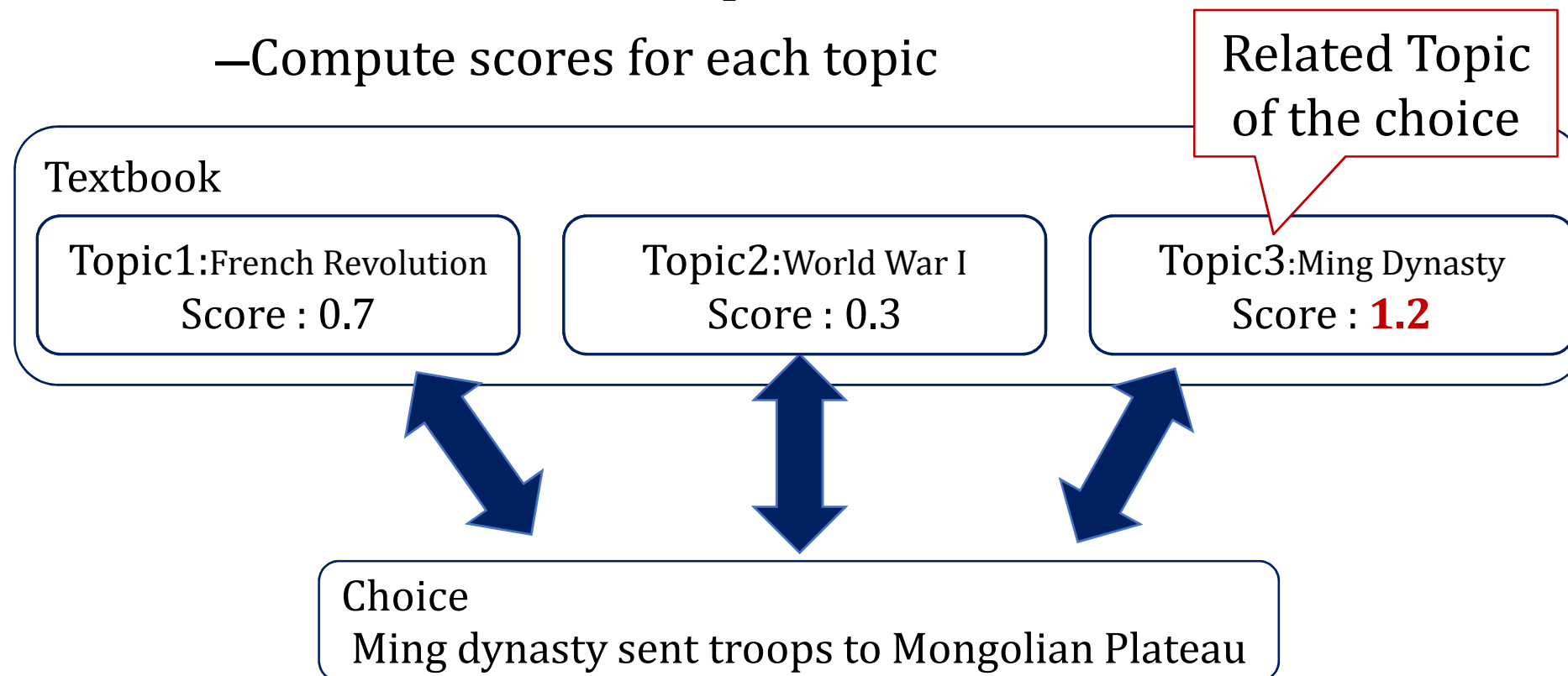
誤りを含む (containing the incorrect one)ものを一つ選べ。



True-or-False

Scoring

- Extract a related topic from the textbook
 - Compute scores for each topic



Score Calculation

- Keyword based scoring

Choice :

明朝は、モンゴル高原に出兵した。

(Ming dynasty sent troops to Mongolian Plateau)

Topic

明朝(Ming dynasty)の永楽帝は積極的な対外政策をとり、
北平ではモンゴル高原に出兵した(sent troops to Mongolian Plateau)。

Same Keyword

Same Dependency

Answer Selection

- Factoid and Slot-filling (Selecting a word)
 - Select the most frequent word which is in a related topic
- Unique Time (Sort of events by chronological order)
 - Use time information which is in related topics
- True-or-False (Selecting a true or false choice)
 - Use scores of related topics of each choice
 - Detect conflict and events

True-or-False

●Select a true or false choice

-need to judge whether each choice is fact or not

Q. 農村や都市について述べた文として最も適当なものを
次のうちから選べ (**select a true choice**)

A. 11世紀に，イギリスでは牧羊を目的に囲い込みが行われた

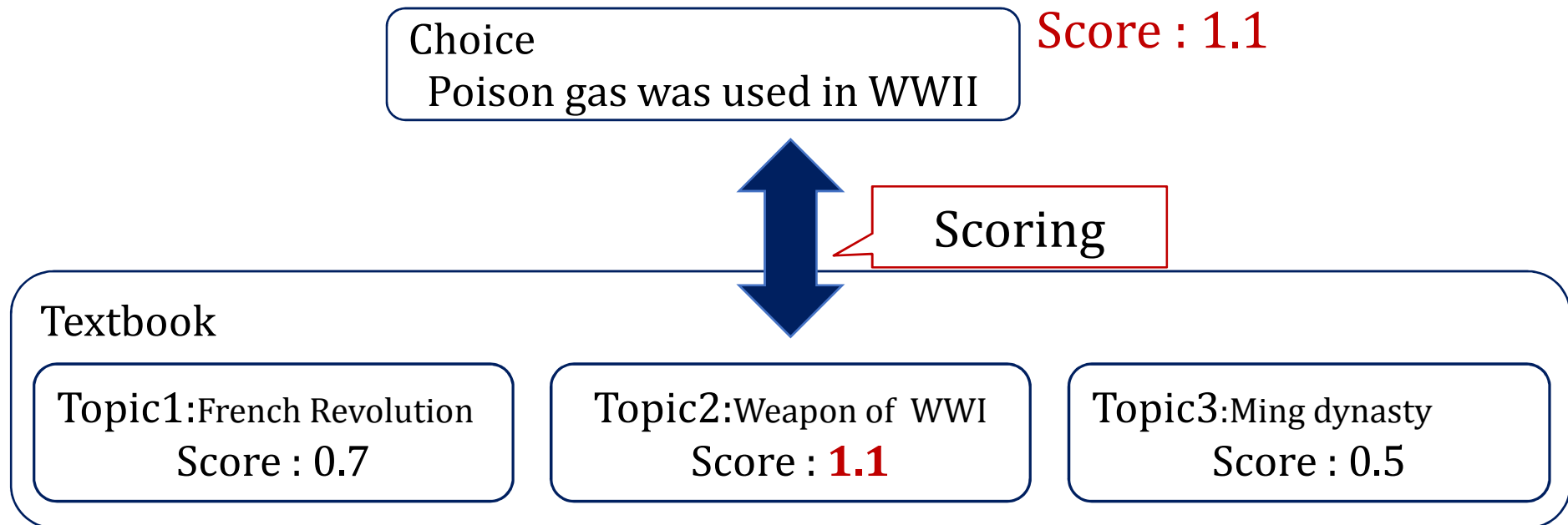
B. 12世紀に，エルベ川以東に，農場領主制が広まった

C. ギルドは，生産・流通の自由競争を保障するために組織された

D. ハンザ同盟は，リューベックを盟主とした

Process for True-or-False

- Score based fact validation
 - The highest score choice is true



Process for True-or-False

- Score based fact validation
 - The highest score choice is true

Use for
Final Decision

Choice
Poison gas was used in WWII

Score : 1.1
Tag : Fact or Conflict

Conflict
Detection

Event
Detection

Textbook

Related topic
Weapon of WWI

Events in
textbook

Conflict Detection

●Detect a conflict in a choice

Choice

イタリアでは、1930年代にムッソリーニがファシスト政権を樹立した。

Time conflict



Compare

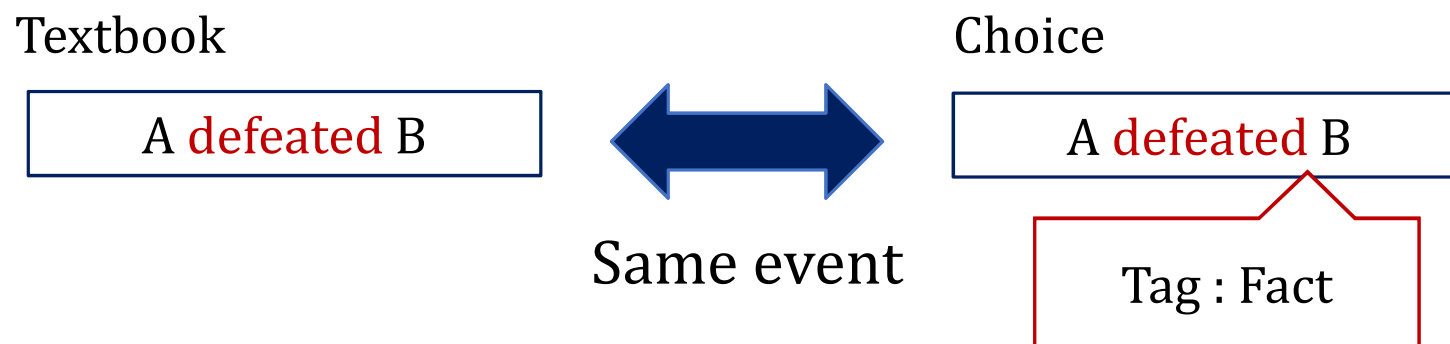
Tag : Conflict

Related Topic

ムッソリーニは1922年、ファシスト党による「ローマ進軍」を組織して政府に圧力をかけ、国王の指示で首相に任命された。

Event Detection

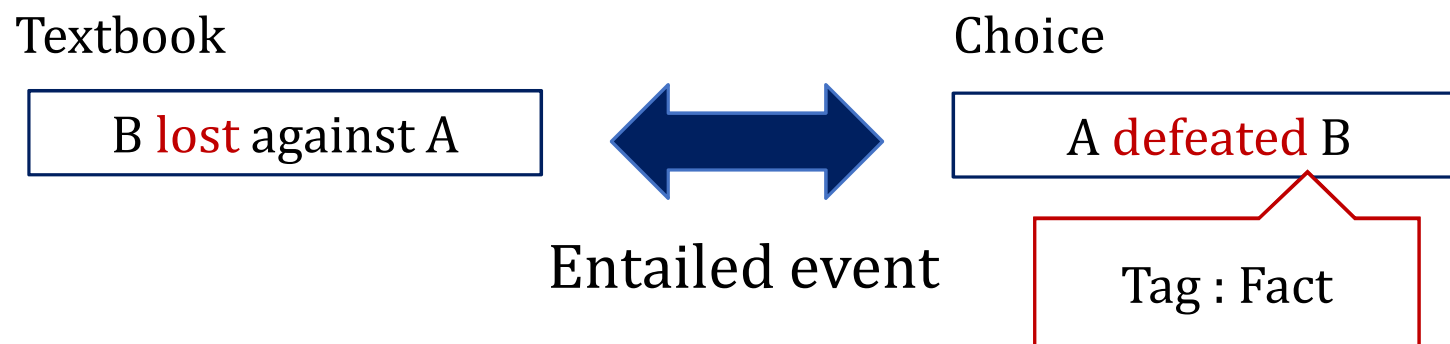
- Focus on the relation between events
- Use definition in event ontology



A. Kawazoe, Y. Miyao, T. Matsuzaki, H. Yokono, and N. Arai. World history ontology for reasoning truth/falsehood of sentences: Event classification to fill in the gaps between knowledge resources and natural language texts. In New Frontiers in Artificial Intelligence (JSAI-isAI 2013 Workshops), Lecture Notes in Computer Science 8417, pages 42-50, 2014.

Event Detection

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Event Detection

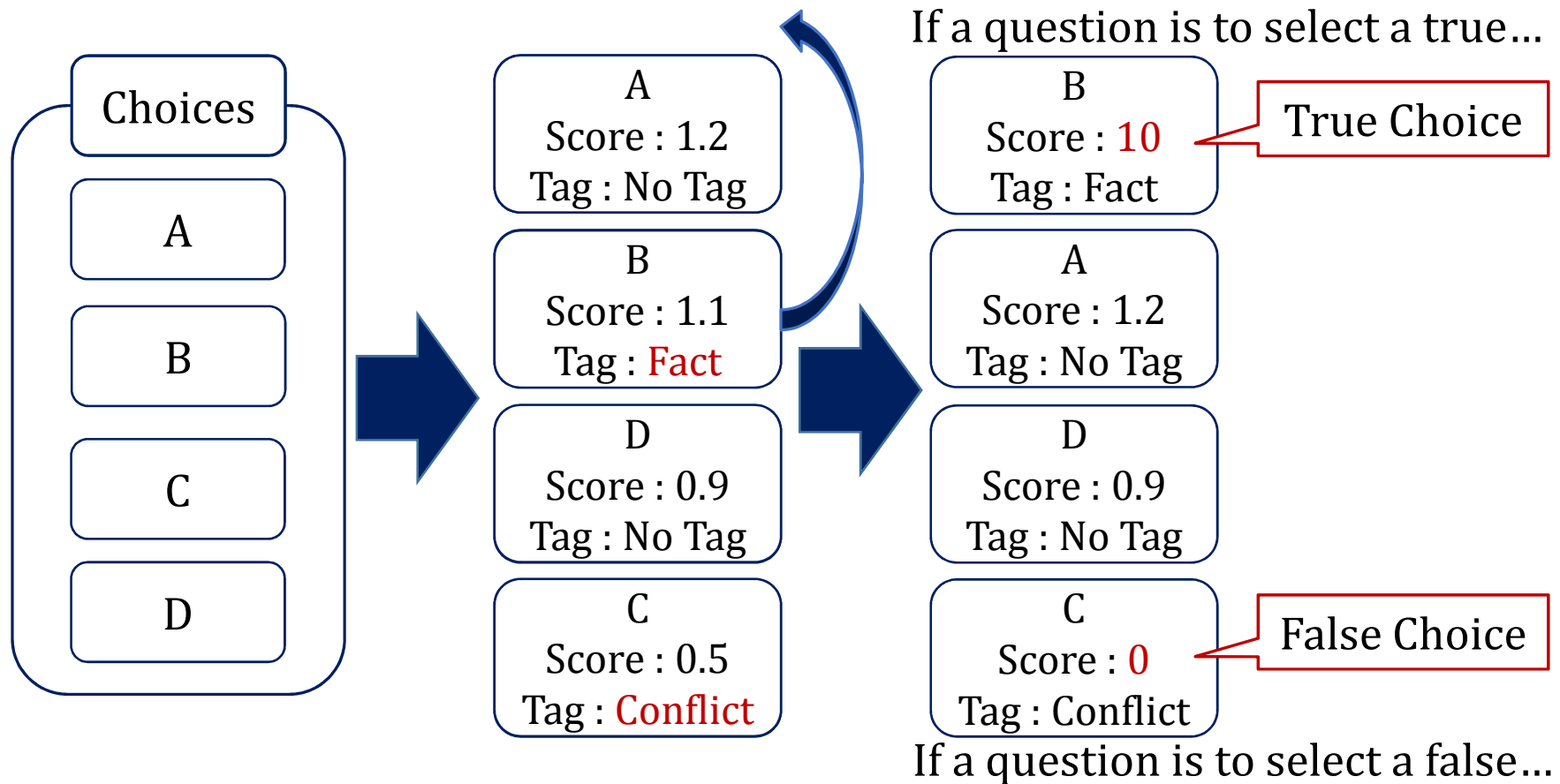
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Final Decision

- Choices are ranked on the basis of scores and tags



Experimental Result

- Phase1-3

 - including Question Analysis and IR results for the combination run

- Average of the formal run for Phase 1-3: 35.3

 - Moderate

- Boosted up other system result in the combination run

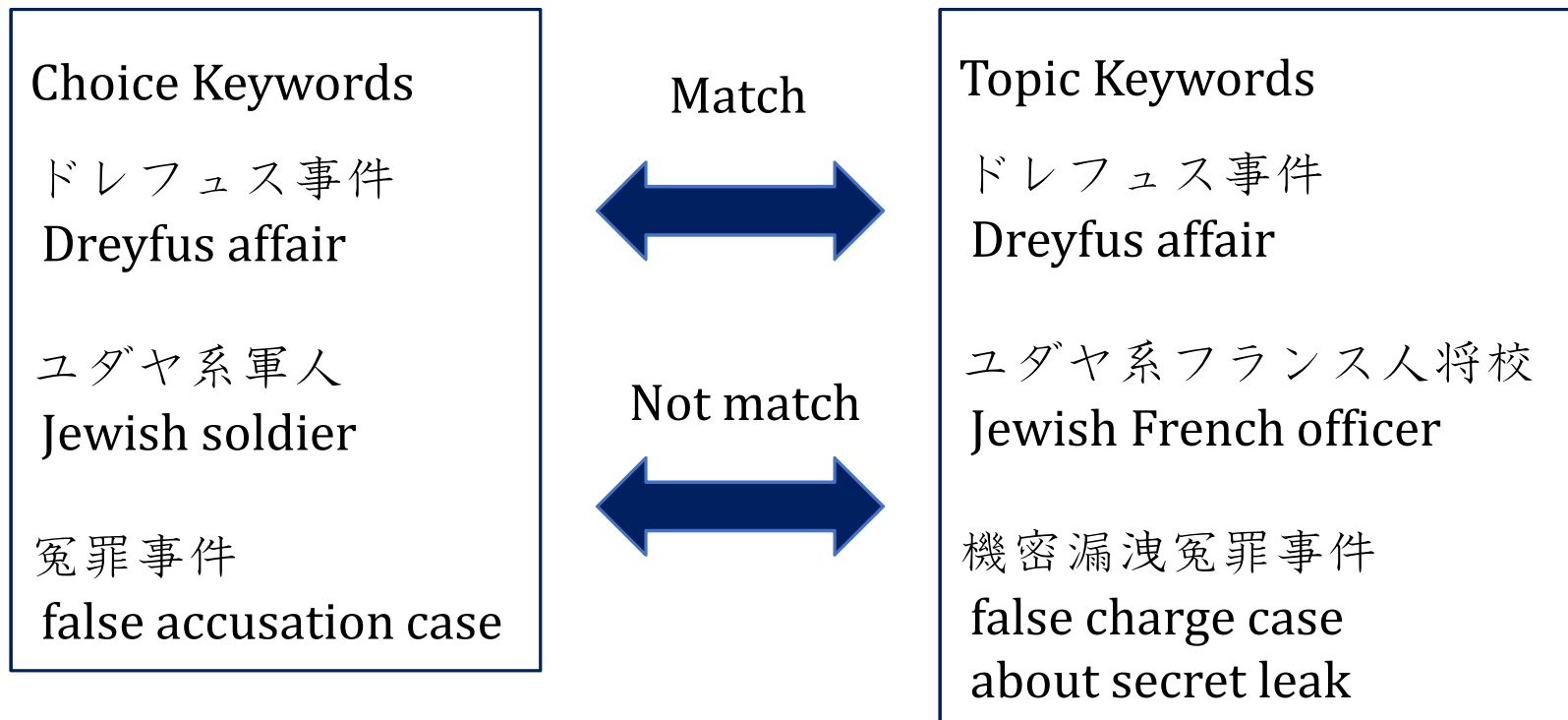
Phase	Team (Priority)	Score	Score of Combination run
Phase1(Benesse)	Forst (2)	26	35
Phase3 (Center)	IMTKU (1)	12	34

Results show effectiveness of our system

Discussion about Scoring

●Scoring

—Made mistakes because of the different notation problem



Discussion about True-or-False

- Conflict detection

- Effective but the number of applicable questions was small

- Event detection

- Not effective because of lack of information

- We only considered too simple structure events

Summary

- KitAi-QA

- Identify the question type by using keyphrase-based rules
- Extract a related topic by scoring
- Select an answer by using a related topic
 - ✓ Conflict detection and event detection for True-or-False

- Result

- Boosted up results of other systems