Methods

**Use distribution of words. [Kano 14]**
Convert to QA. [Kanayama 13, Okita 14]
Use abstract expression. [Tian 14]

**Characteristic**
Coverage↑Exactness↓
Some questions cannot be converted.

Coverage↓Exactness↑

**Observations**
We examined questions from following viewpoint:

- **Time/Location**
  - NEs in a single paragraph
  - In the choice are wider than knowledge base's one?

**Sufficient only Locality information. But need recognizing entailment for Time/Loc expressions.**

**Dictionaries & Modules**
We made following dictionaries and modules.

**Dictionaries/Modules**
**Explanation**

- **Named Entity**
  - With types like "person", "nation".

- **Synonym**
  - Synonyms.

- **Hypernym, Hyponym**
  - Hypernyms, Hyponyms. This dictionary include inclusion information about location.

- **Suffix**
  - Suffixes like "-s", "-ian".

- **Event to year converter**
  - Historical event to time.

- **Recognize entailment for time expression**
  - Module for judging time inclusion relations.

**Use distribution of words.**

**Hypothesis**
True sentence, co-occurrence of two words is high, and three or more words relations are strong.

**PMIScore/TimeScore/RankScore**
- **PMIScore**
  - To evaluate co-occurrence of two words
  - TimeScore, RankScore for considering the relation between one NE and the other words

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- **Recognize entailment for time expression**
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**Use abstract expression.**

**Hypothesis**
A similar abstract expression of true sentence exists in the knowledge base, but false sentence's one does not.

**TreeSimScore/WMScore/WEScore**
First, we convert choice sentences into pred-arg trees.

**Discussion/Error Analysis**

**Main causes**

<table>
<thead>
<tr>
<th>Cause of error</th>
<th>Too frequent NE.</th>
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<tbody>
<tr>
<td>Fail to match synonym.</td>
<td></td>
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<tr>
<td>Fail to extract important words from the instruction.</td>
<td></td>
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<tr>
<td>Lack of recognizing causal relation.</td>
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<tr>
<td>NE is not contained in the dictionary.</td>
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<tr>
<td>Fail to recognize replacement of sbj and obj.</td>
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<tr>
<td>Fail to extract time expression.</td>
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