Semantic parsing with graph transformations

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- Results show some improvement on the task

The machine comprehension task (Chen et al., 2018; Wang et al., 2018)

Text: "Today we decided to paint the extra room in our house. Were going to have visitor coming next month so hopefully the painting ain't that smelly anymore. I made sure that the wall is clean and clear of all the nuisance. We already bought the pain and we decided the new wall pain is sky blue. My husband is putting newspaper on the floor to avoid any spill on our floor/carpet....."
Question: "Did anyone help him?"
1st answer: "It was the narrator and her husband"
2nd answer: "No, he worked alone."

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- **MCScript**
  - training and test data

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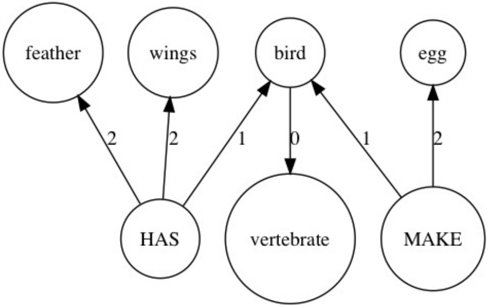

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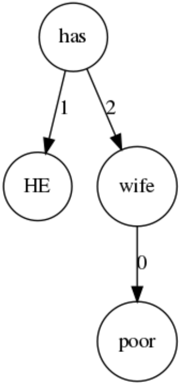

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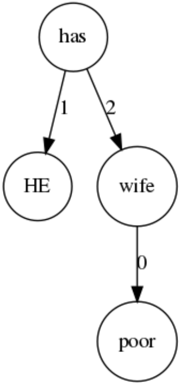

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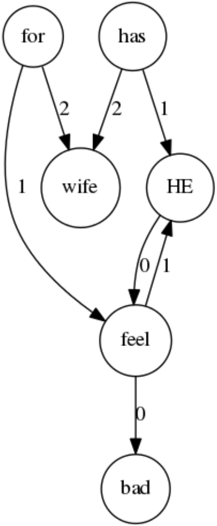

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- $$\frac{|E(G_1) \cap E(G_2)|}{|E(G_2)|}$$

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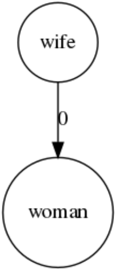

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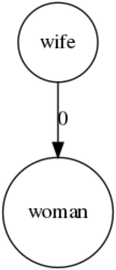

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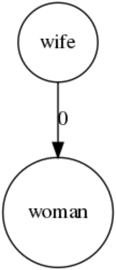

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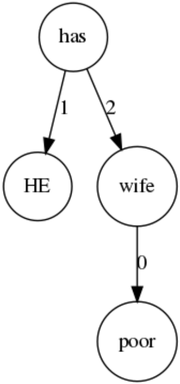

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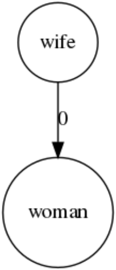

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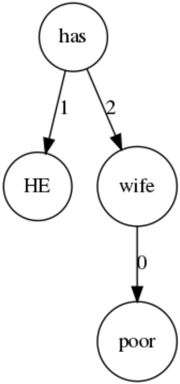

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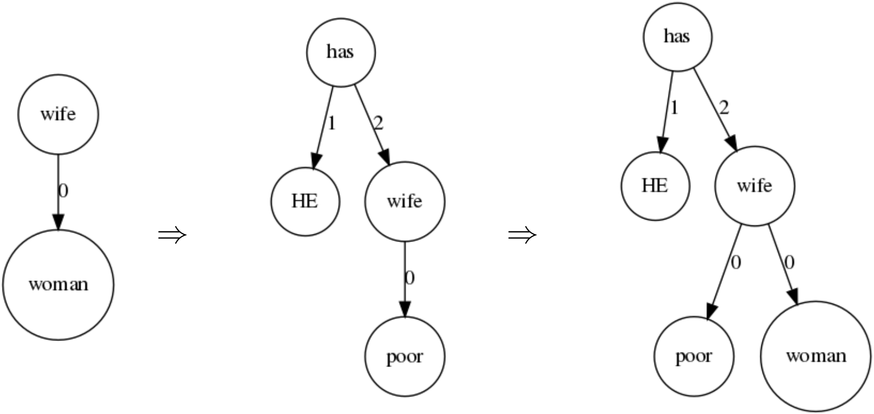

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- Merged graph for all question-answer pair
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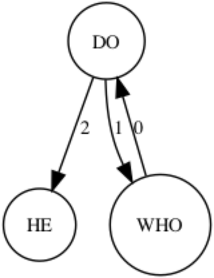

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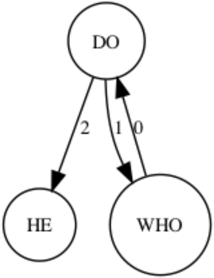

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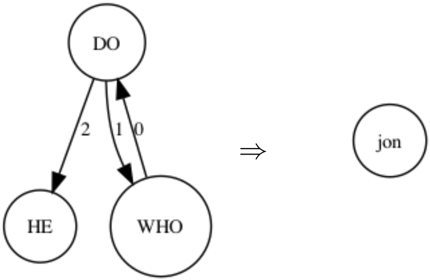

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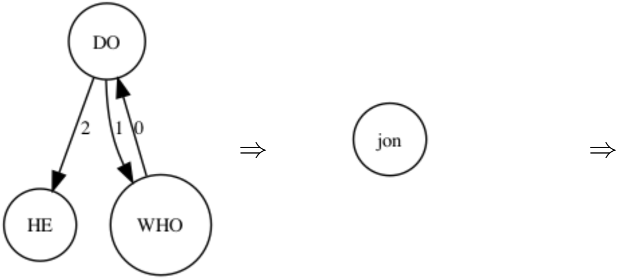

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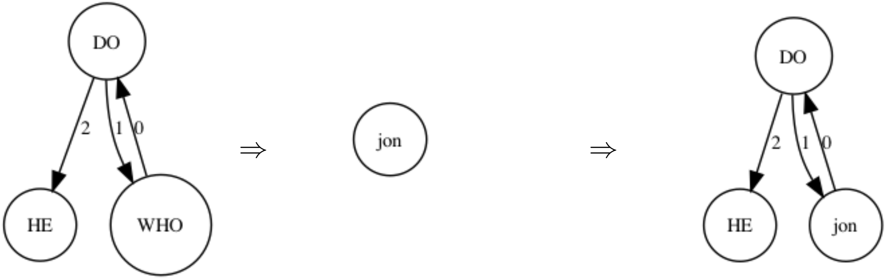

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Yuanfudao system

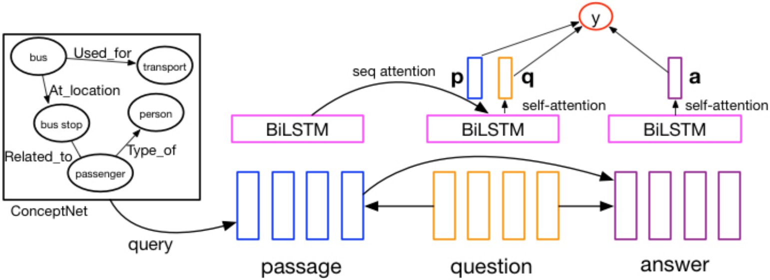

Figure: The structure of the system

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- Expansion of the RNN layer, that the corresponding RNN gets the `4lang` embedding's output

Results

model	dev	test
TriAN, no ConceptNet	82.8%	80.2%
TriAN, with ConceptNet	82.7%	80.5%
TriAN, with 4lang	**83.2%**	**80.9%**
TriAN, with both	83.1%	80.8%

Table: Effect of `4lang` and `ConceptNet` on results

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model	dev	test
TriAN, no ConceptNet	83.7%	81.9%
TriAN, with ConceptNet	82.5%	80.3%
TriAN, with 4lang	84.2%	81.5%
TriAN, with both	**83.4%**	**82.9%**

Table: Effect of `4lang` and `ConceptNet` on the pretrained models

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pretrained, ensembled model	test
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TriAN, with ConceptNet	83.697%
TriAN, with 4lang	82.8%
TriAN, with both	**83.73%**

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Thank you for your attention!

Chen, Zhipeng et al. (2018). "HFL-RC System at SemEval-2018 Task 11: Hybrid Multi-Aspects Model for Commonsense Reading Comprehension". In: *arXiv preprint arXiv:1803.05655*.

Kornai, András (2010). "The algebra of lexical semantics". In: *Proceedings of the 11th Mathematics of Language Workshop*. Ed. by Christian Ebert, Gerhard Jäger, and Jens Michaelis. LNAI 6149. Springer, pp. 174–199.

Kornai, András et al. (2015). "Competence in lexical semantics". In: *Proceedings of the Fourth Joint Conference on Lexical and Computational Semantics (*SEM 2015)*. Denver, Colorado: Association for Computational Linguistics, pp. 165–175.

Wang, Liang et al. (2018). "Yuanfudao at SemEval-2018 Task 11: Three-way Attention and Relational Knowledge for Commonsense Machine Comprehension". In: *arXiv preprint arXiv:1803.00191*.