We propose clause-level edit methods with Python-style representations to use language models of code for SQL correction

Text-to-SQL Error Correction with Language Models of Code

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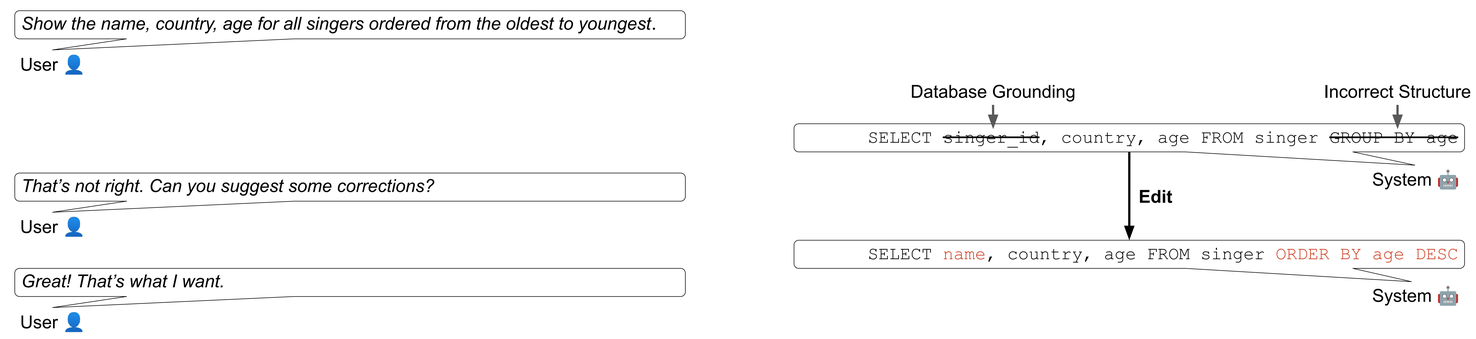
Our code and data:
https://github.com/OSU-NLP-Group/Auto-SQL-Correction

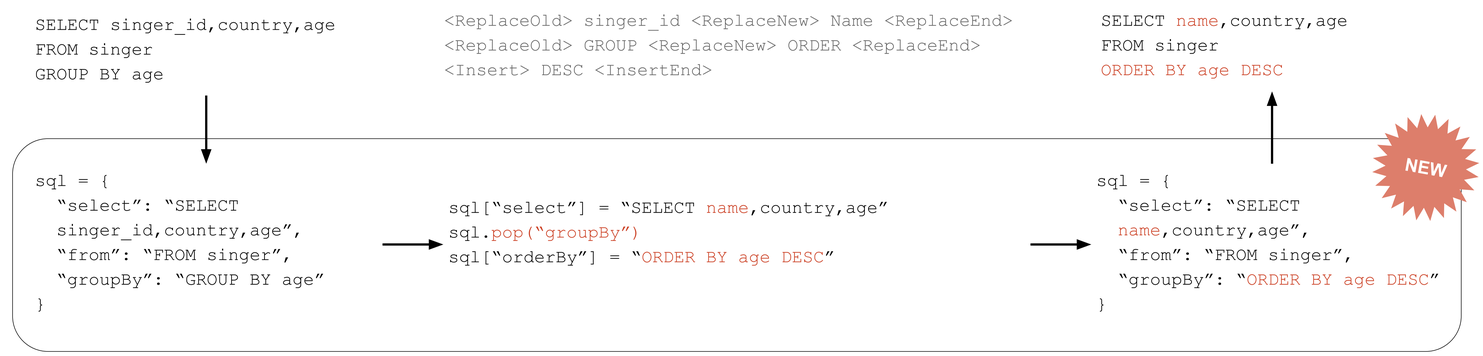
Text-to-SQL Error Correction

- Recent text-to-SQL parsers can reach decent accuracy, but they are still not accurate enough in practice
- We study how to correct errors in parser-generated SQL queries with language models of code



Our Method: Clause-Level Editing and Python Representation

- Token-level edits represented with special tokens can be ambiguous
  - *Use clause-level edits to mitigate ambiguity issues*
- Most language models of code (e.g. CodeT5) are not pre-trained on SQL
  - *Propose Python-style representations to better use language models of code*



Experiments and Results

Experimental Setup

- Data synthesis: 5-fold cross-validation on Spider for each parser
- Fine-tune CodeT5 (and CoditT5) on our synthesized data with different representations

Results

- CodeT5 shows considerably lower zero-shot perplexity on our proposed representation
- CodeT5 consistently achieves statistically significant improvement using our proposed representation
- Simulating user interactions with CodeT5 can further improve text-to-SQL parser's accuracy