Always use fresh data to evaluate your LLMs! SQL helps analyze tables, but they must be clean.

Generating Data Insights with LLMs by Querying Tables

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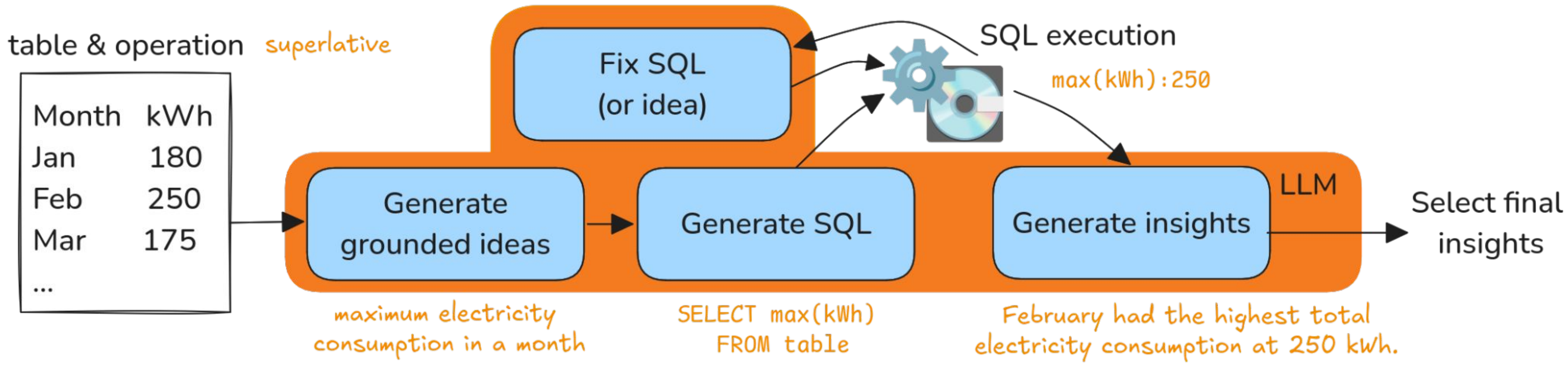
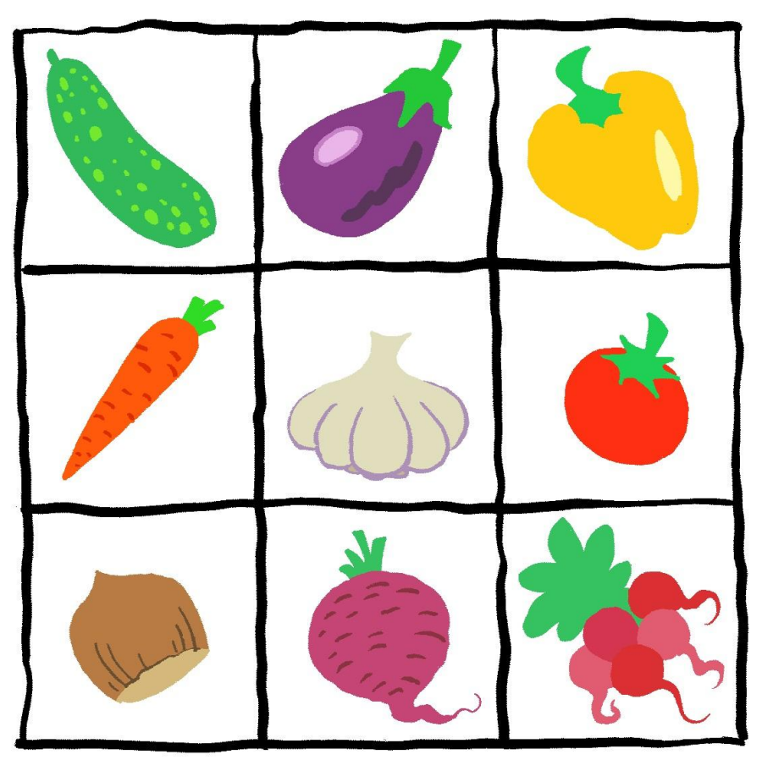


FreshTab



Problem

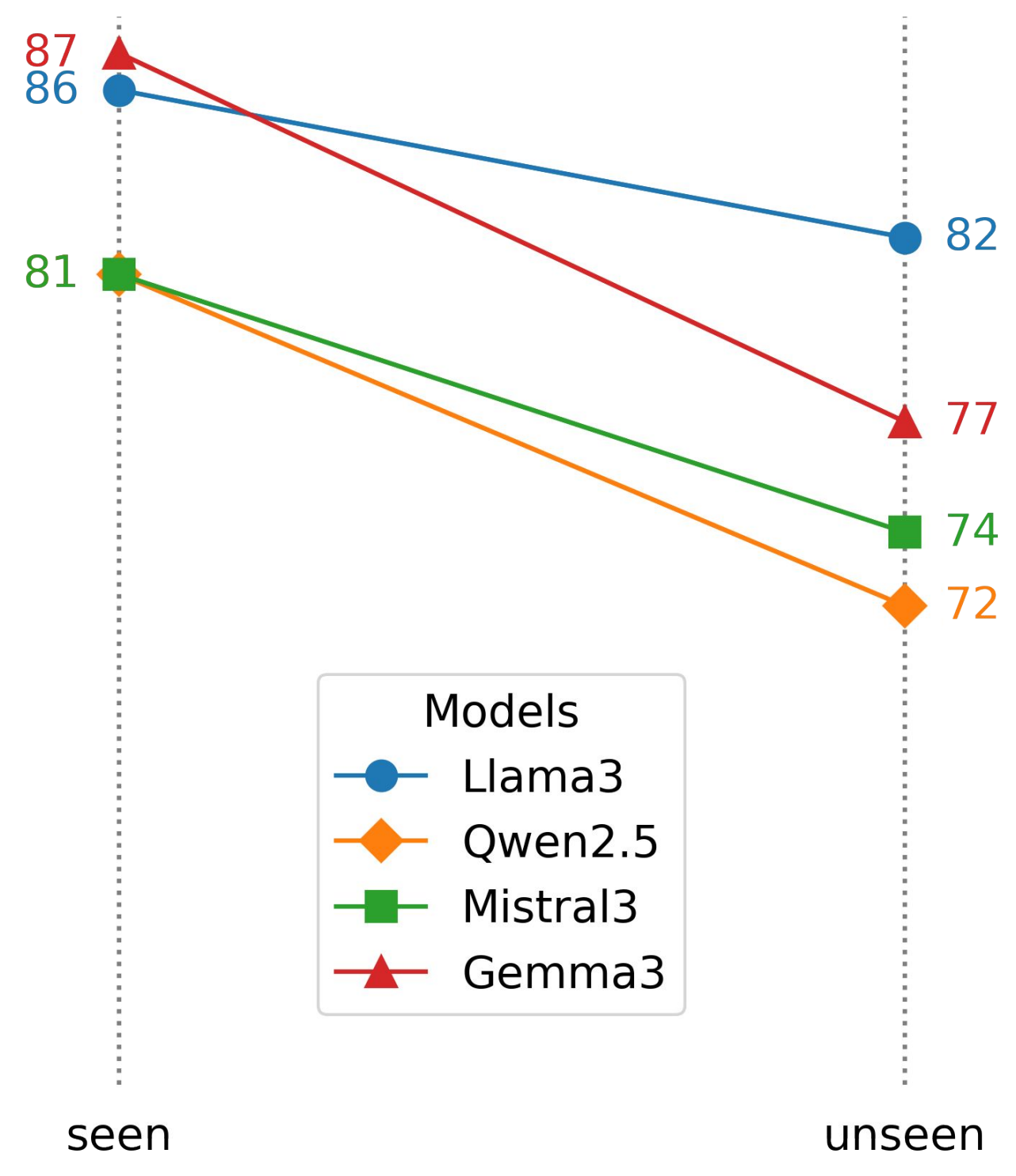
- LLMs **memorized** existing **datasets** (LogicNLG, LoTNLG)
- Datasets contain mostly sports, **no domain** distinction
- They are usually **English only**

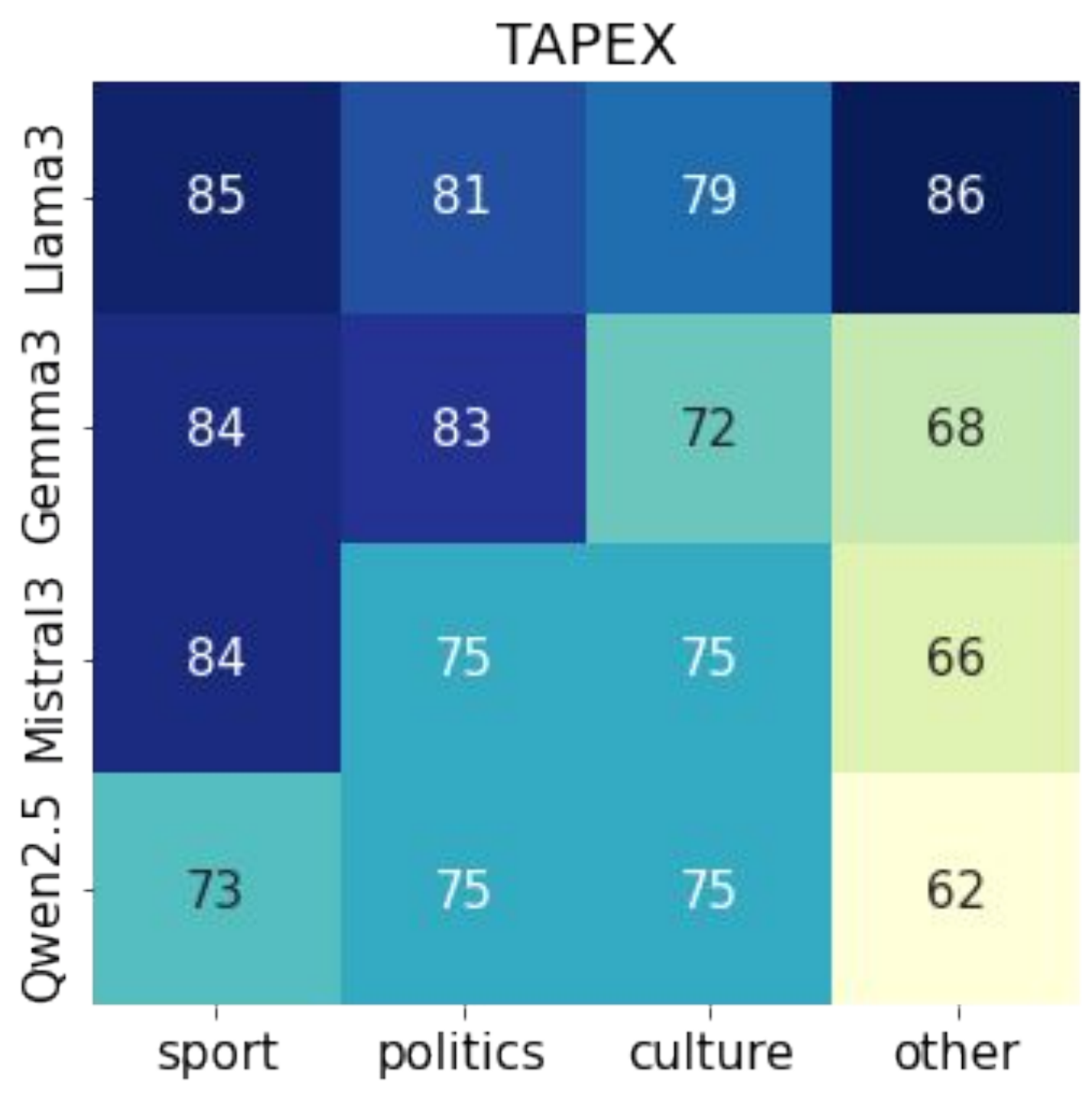
Solution

- **Dynamic dataset construction** based on creation date
  - **Query** Wikidata and **Wikipedia** for list of Wikipages
  - **Scrape**, clean and pick a **table** per Wikipage
  - Filter tables for domain balance

Results

- LLMs' **performance** visibly **decreases** with unseen data
- FreshTab can **differentiate LLMs** by their **ability to generalize**
- Domain split helps us pinpoint where the models have deficit





Observations

- Llama 3.3 70b seems to generalize best to new data
  - most balanced performance across domains
- Sport domain is easiest, as expected from lot of training data

SQuirreL

From real a human!

Problem

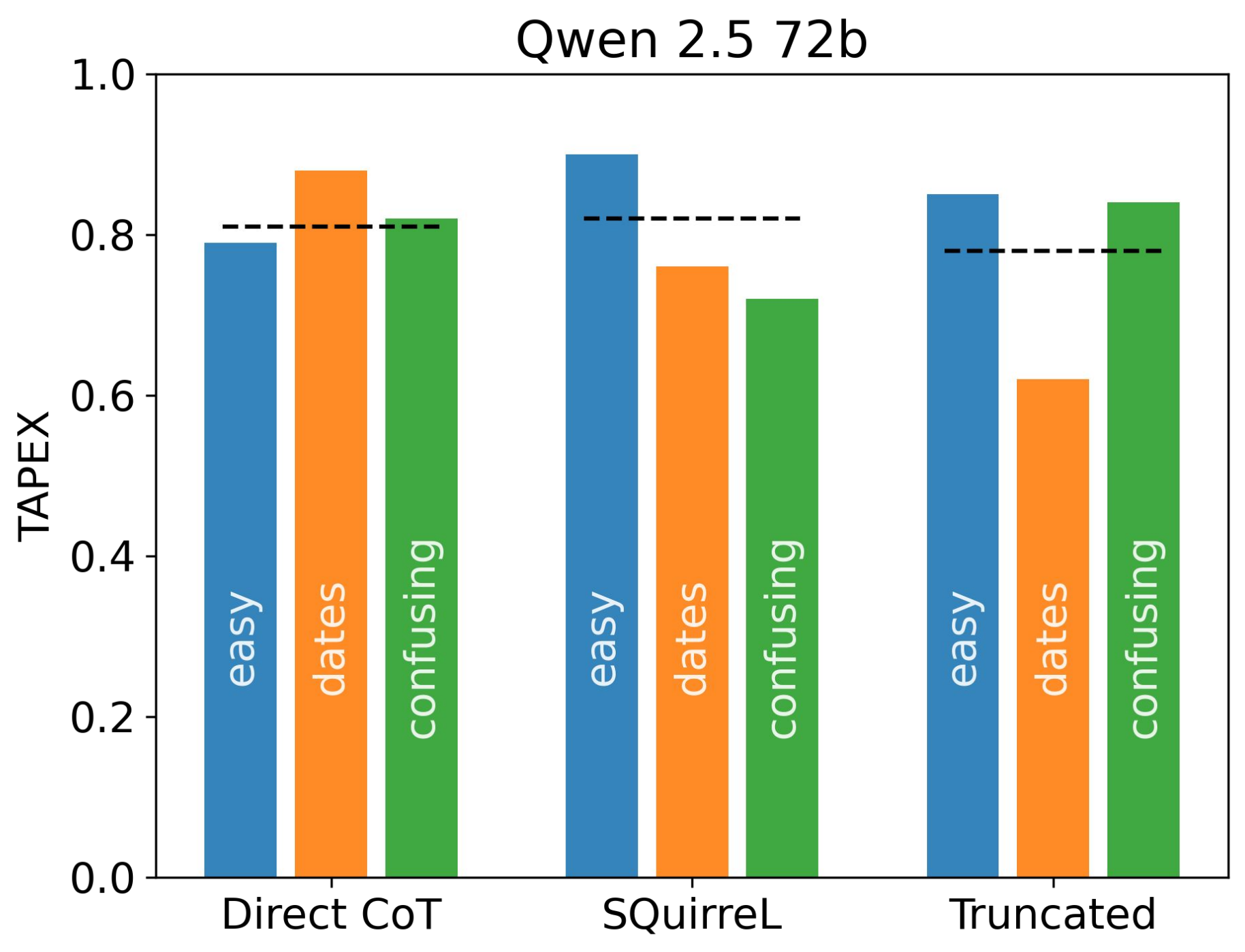
- Symbolic logical forms are **hard to scale**
- LLMs are **hallucinating** and weak at logic

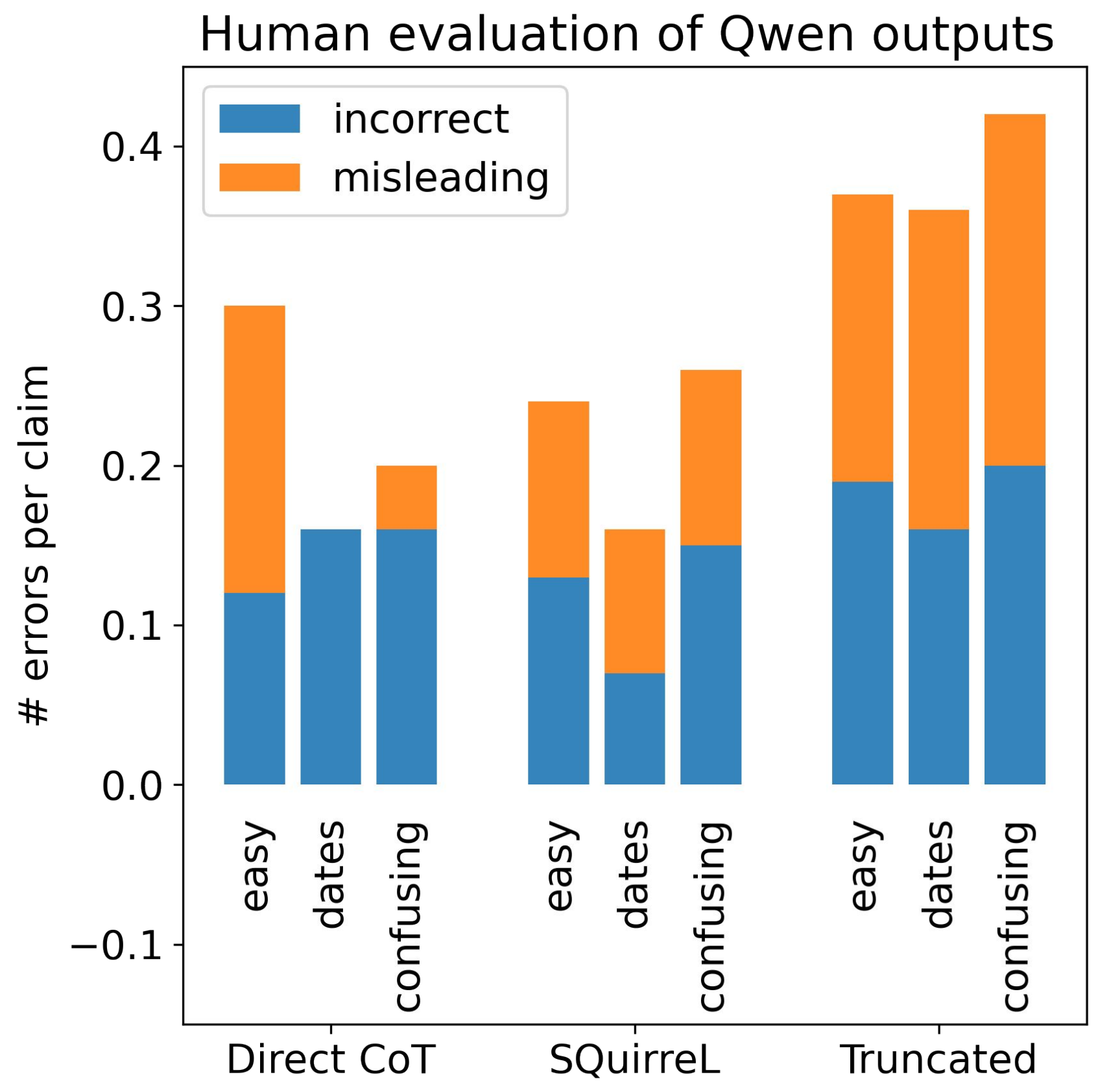
Solution

- SQuirreL: **Ground** LLMs **in data** retrieved with SQL
  - as a bonus, it is nicely **checkable**
  - can work with truncated tables **on bigger data**

Results

- Factuality does not improve. **Why**?
- Some **tables** are **not well defined** and are confusing
  - We can detect those tables
- SQL needs well-defined tables to work





Observations

unnamed	entering	advancing
First round (14 teams)	14 Second League teams	-
Last 16 (16 teams)	5 Premier League teams	11 winners
Semi-finals (4 teams)	-	8 winners

event	men
5000 metres	13:01.00
High jump	2.33
Decathlon	8550

candidate	votes
dog	60
cat	70
Total	130

Presented at Machine Learning Prague 2025.
Funded by the European Union (ERC, NG-NLG, 101039303),
Charles University projects SVV 260 698,
National Recovery Plan funded project MPO 60273/24/21300/21000 CEDMO 2.0 NPO.

https://github.com/Kristyna-Navitas/FreshTab