# Dialogue State Generation: Transcending Slot Schemas for Domain-General State Inference

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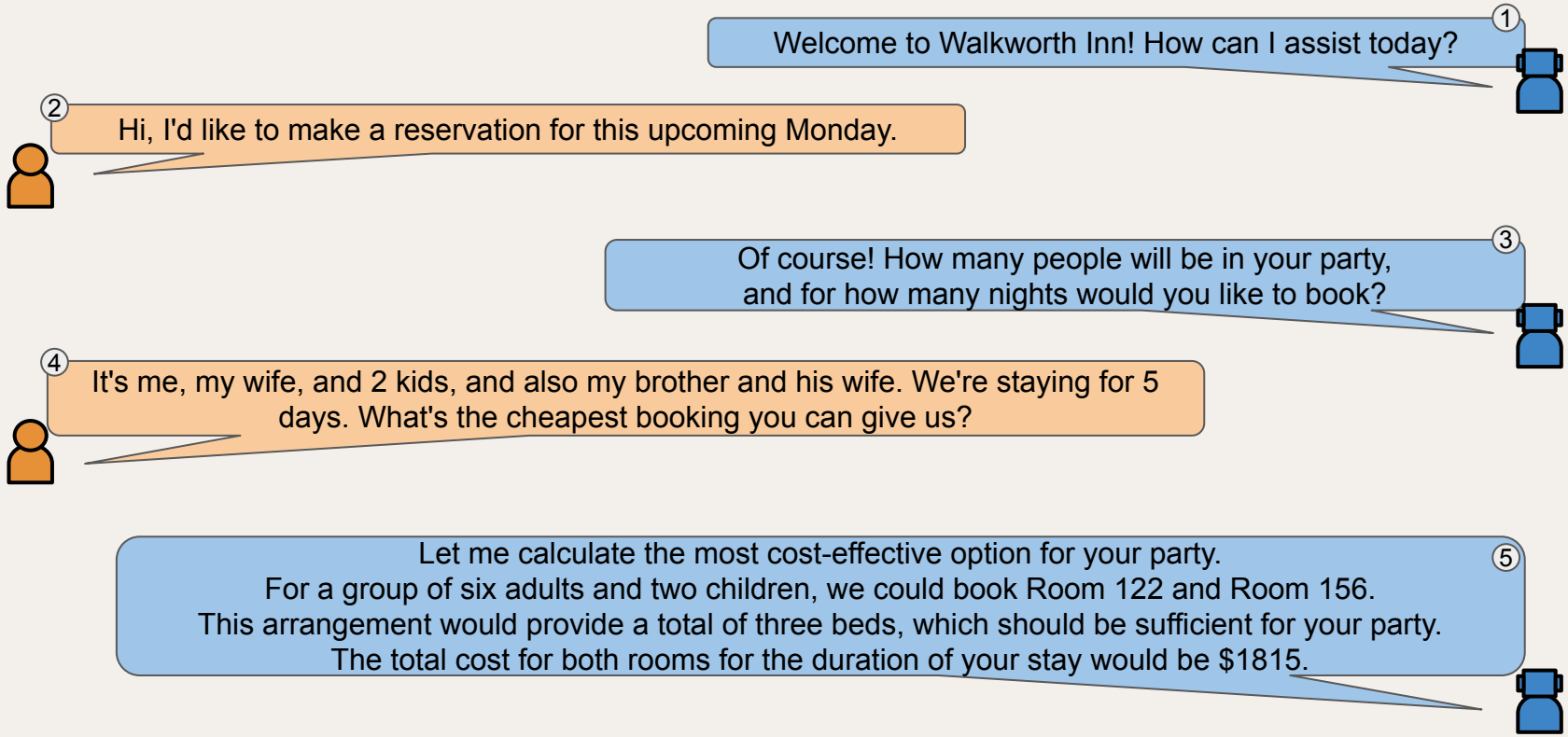
# Dialogue State Tracking



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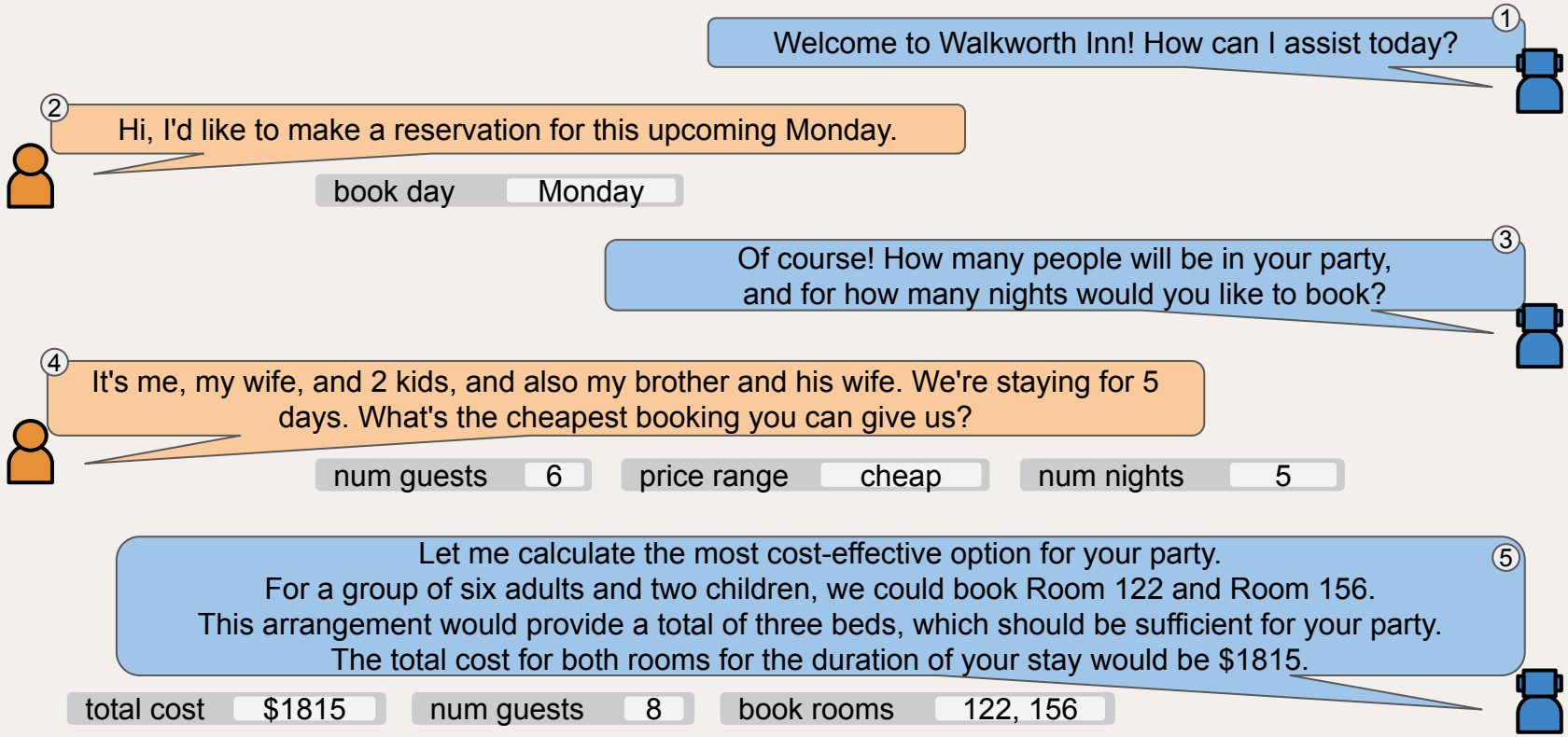

# Limited DST Domain Diversity

- Slots are different for every application
- DST data limited in diversity
- Tackle domain generalizability via *Dialogue State Generation*

| | Domains | Slot Types | Dialogues |
|---|---|---|---|
| **MultiWOZ** | 7 | 24 | 8,438 |
| **SGD** | 16 | 214 | 16,142 |

Rastogi, Abhinav, Xiaoxue Zang, Srinivas Sunkara, Raghav Gupta, and Pranav Khaitan. 2020. "Towards Scalable Multi-Domain Conversational Agents: The Schema-Guided Dialogue Dataset." *Proceedings of the AAAI Conference on Artificial Intelligence* 34 (05): 8689–96. https://doi.org/10.1609/aaai.v34i05.6394.

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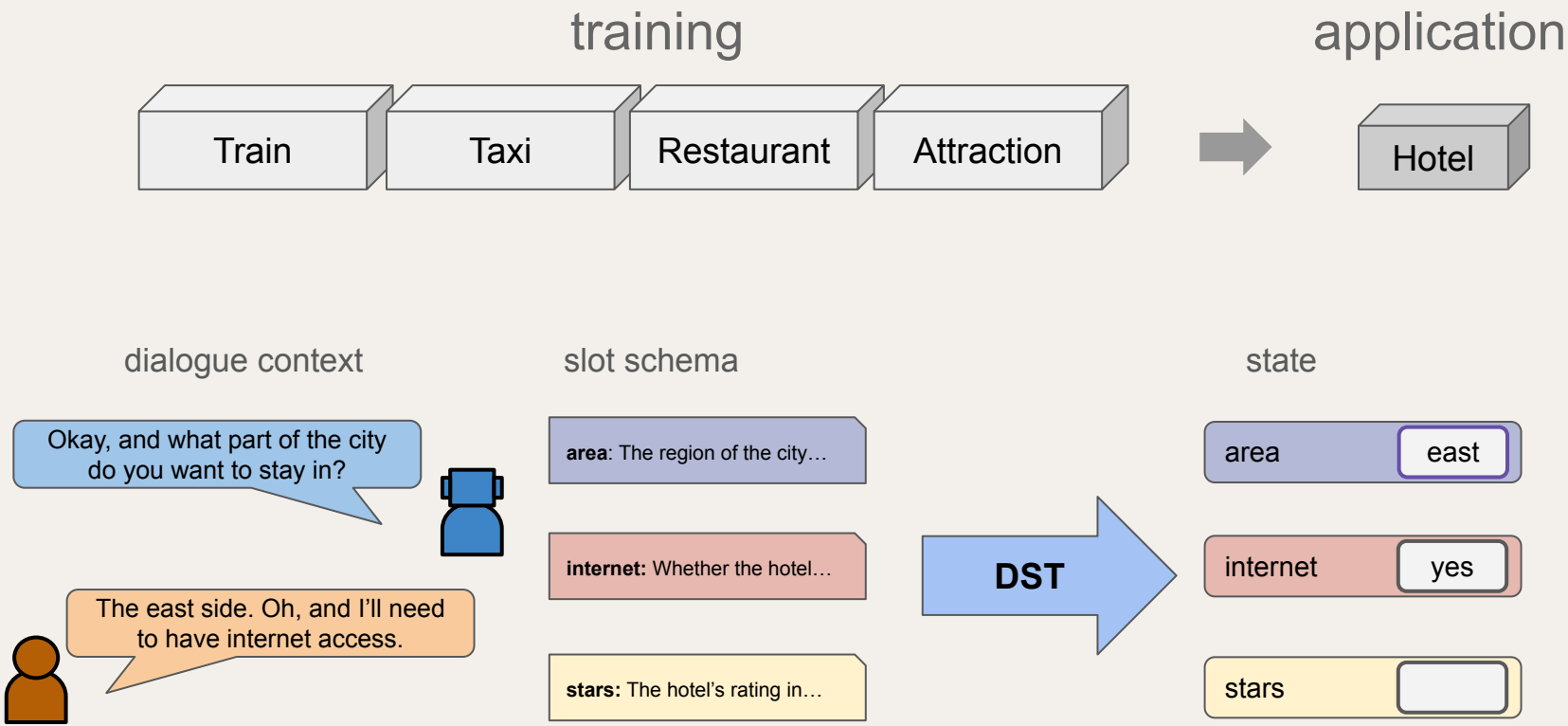
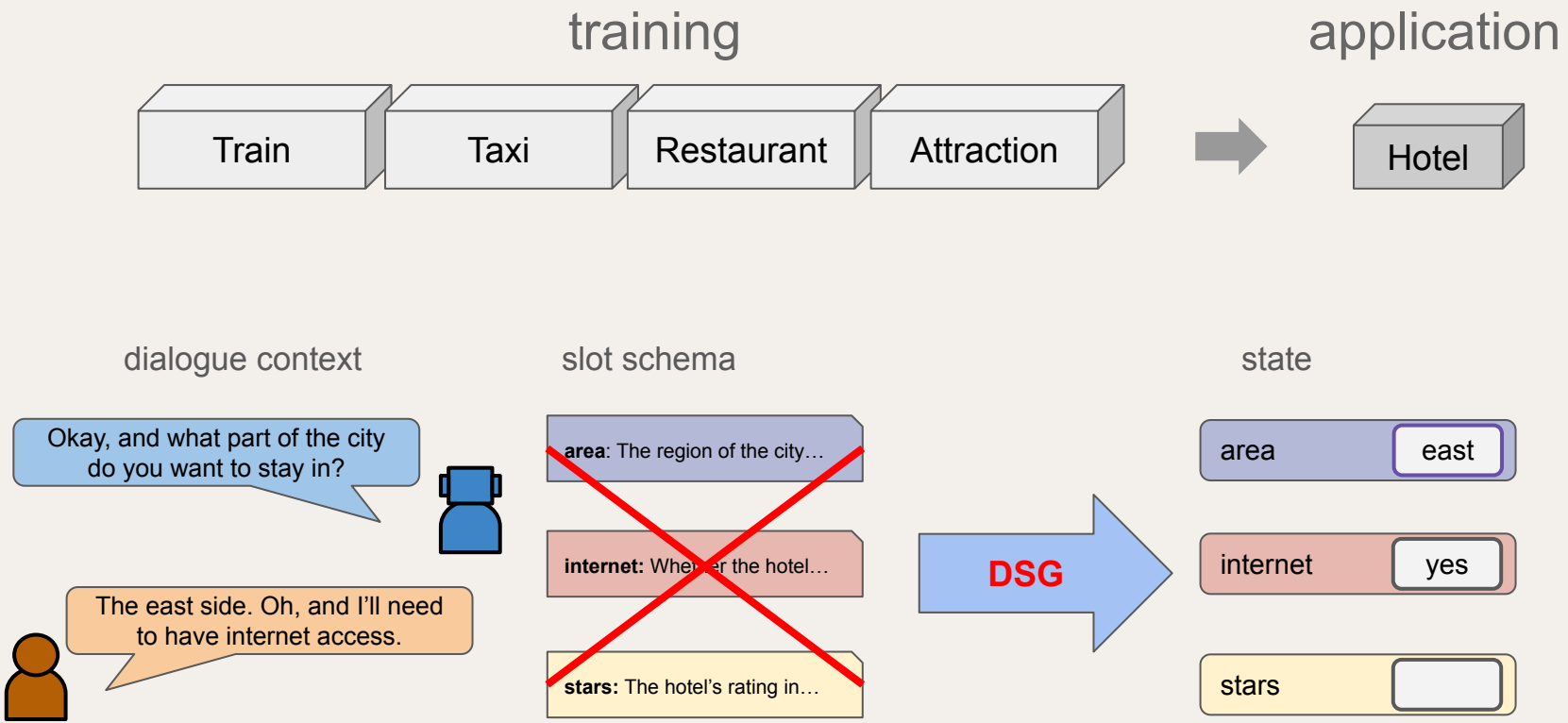
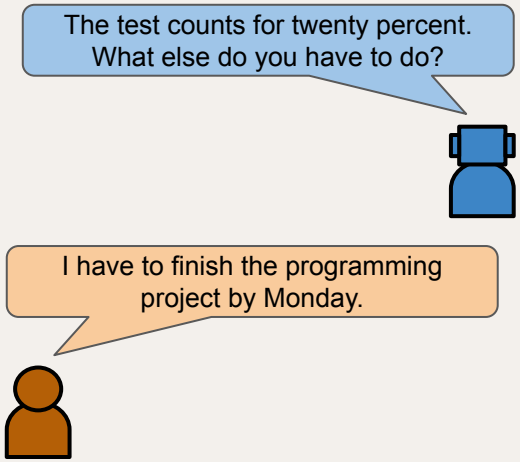

training
application
Train
Taxi
Restaurant
Attraction
Hotel
dialogue context
slot schema
state
Okay, and what part of the city do you want to stay in?
The east side. Oh, and I'll need to have internet access.
area: The region of the city…
internet: Whether the hotel…
stars: The hotel's rating in…
DST
area
east
internet
yes
stars

# Dialogue State Generation

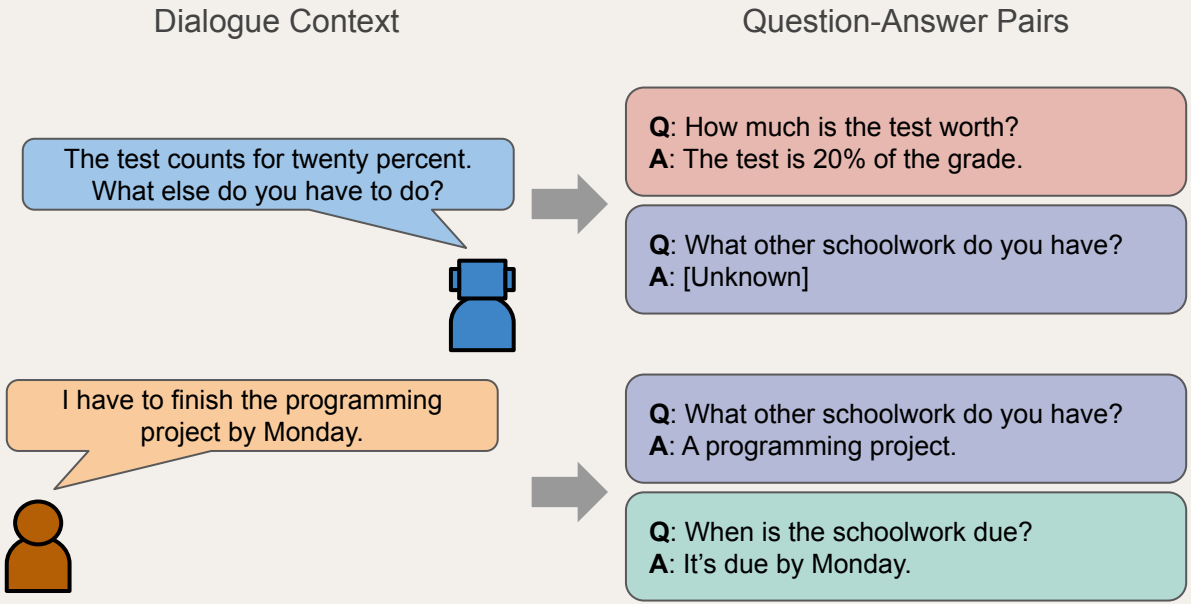


# Dialogue State Generation using ILLMs

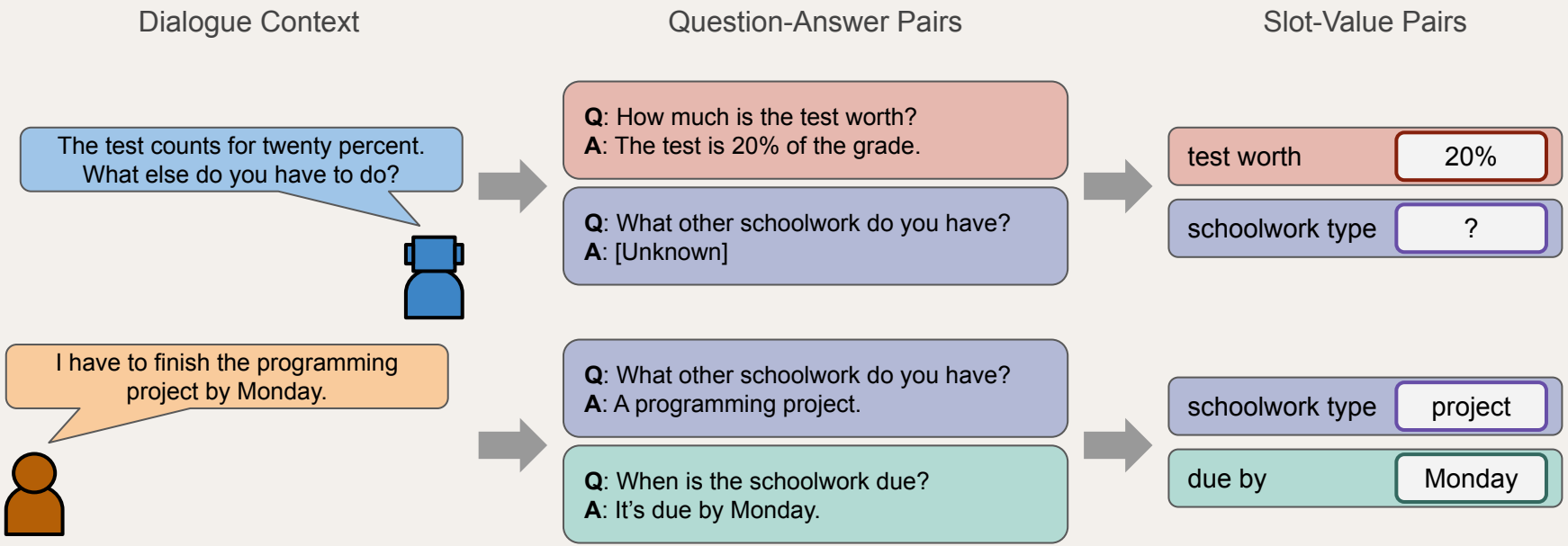
Dialogue Context



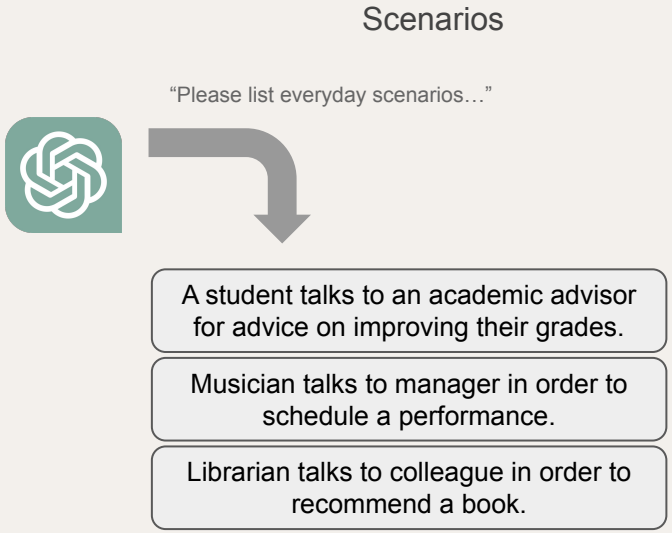
# GPTPipe: DSG with LLMs



# GPTPipe: DSG with LLMs



# DSG5K: Domain-Diverse Dialogue Dataset



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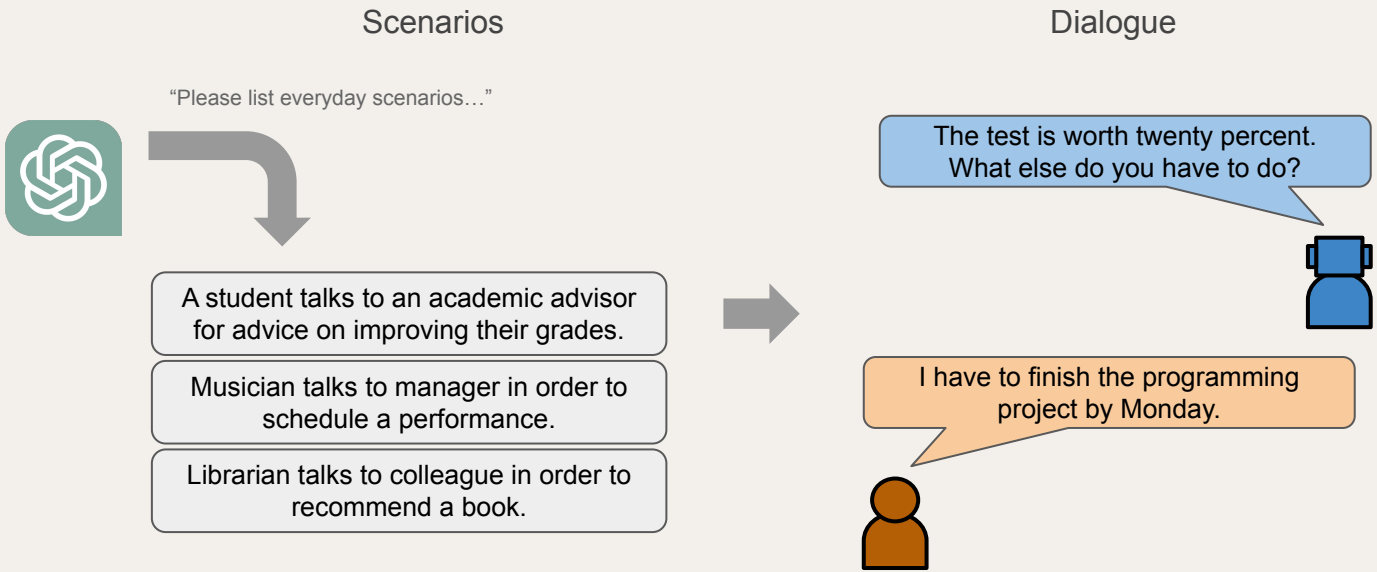
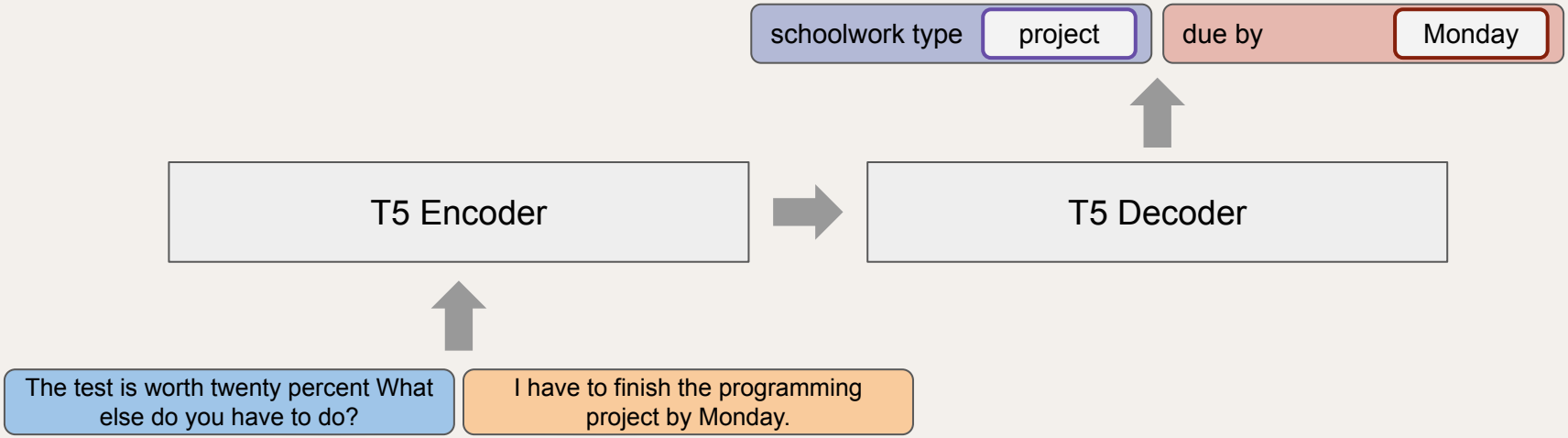


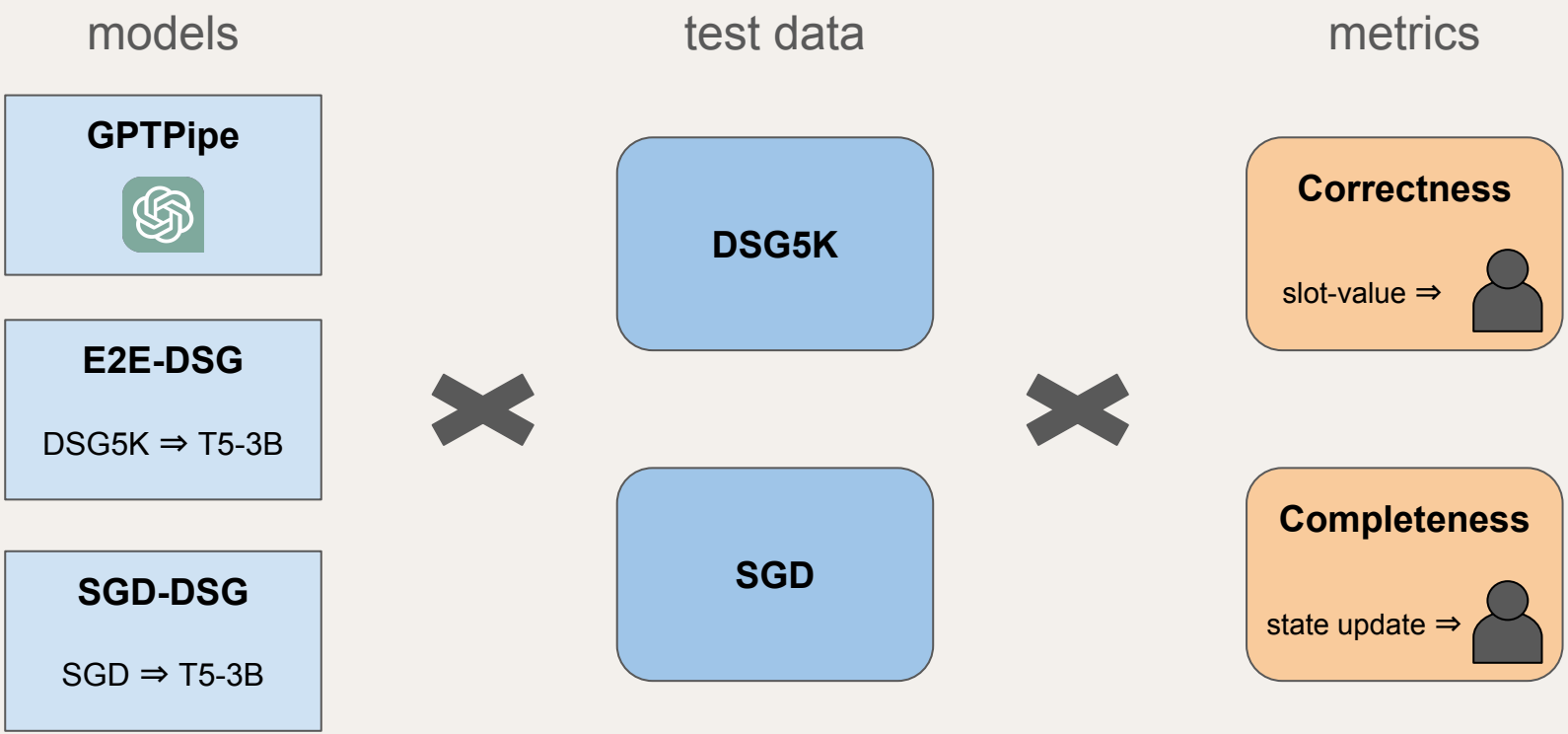
# DSG5K: Domain-Diverse Dialogue Dataset

- 1,000 scenarios
  - mix of task-oriented and “role-oriented”
- 5 dialogues per scenario
- 5,000 dialogues total
- Automatically annotated with GPTPipe

# End-to-End Model

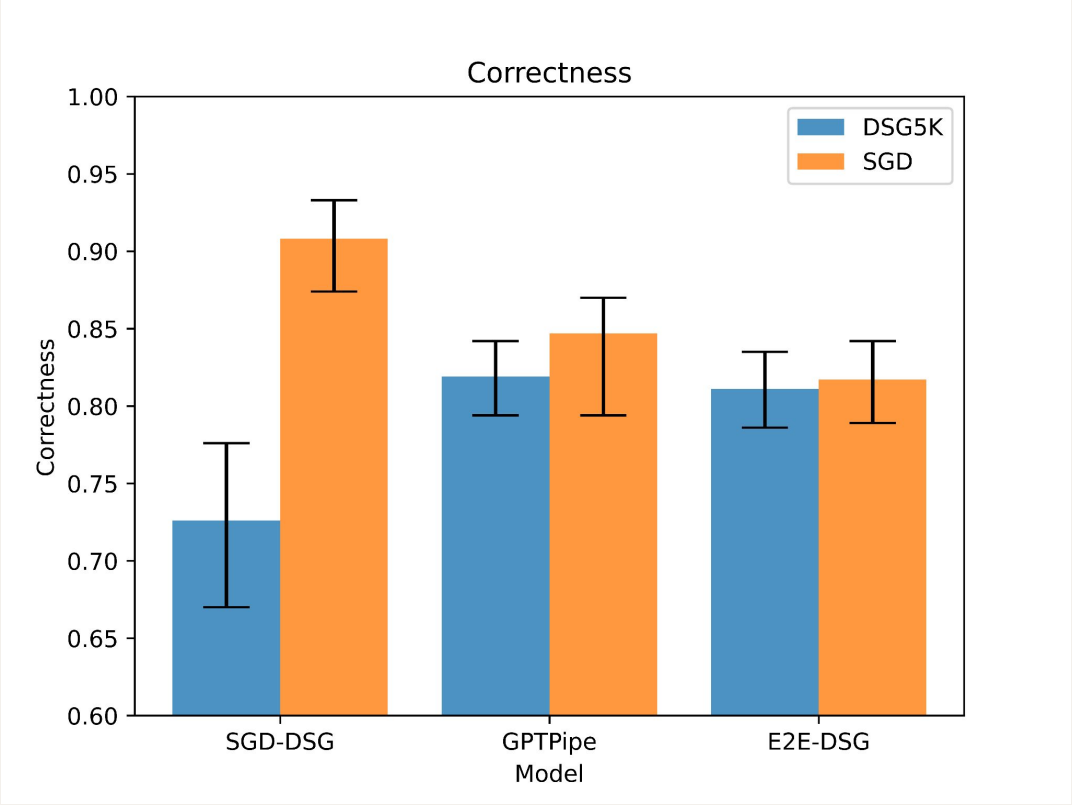


# Experiments

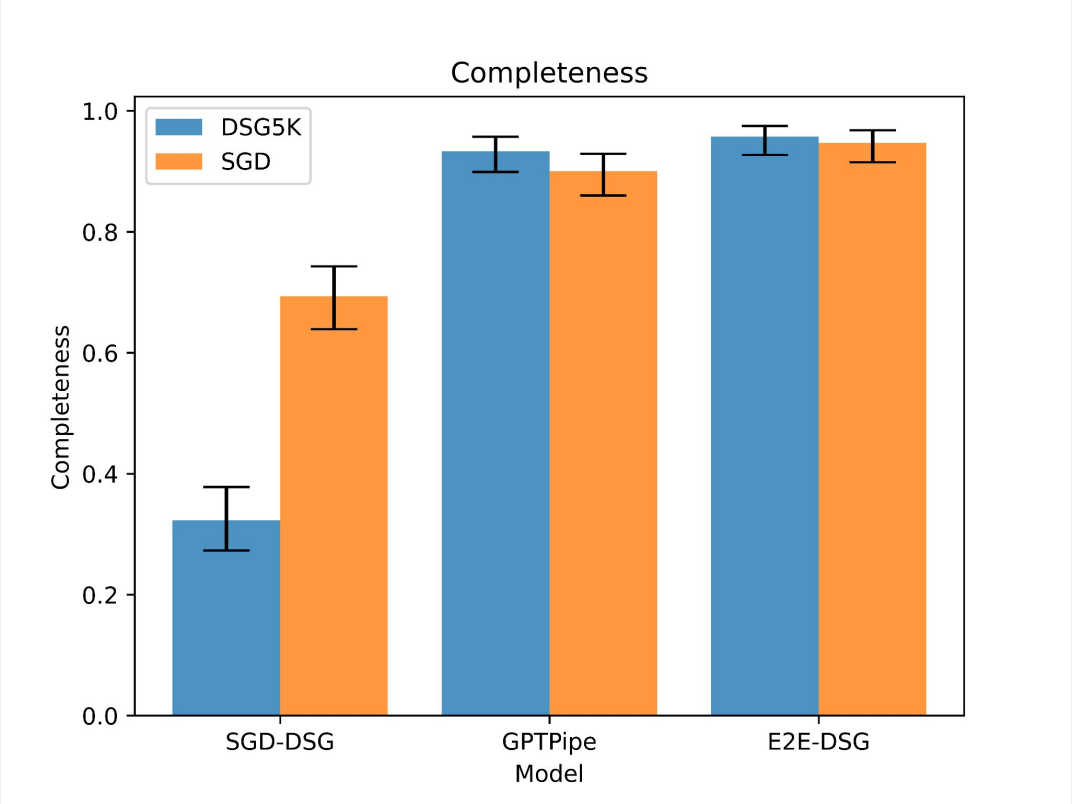



Raffel, Colin, Noam Shazeer, Adam Roberts, Katherine Lee, Sharan Narang, Michael Matena, Yanqi Zhou, Wei Li, and Peter J. Liu. 2020. "Exploring the Limits of Transfer Learning with a Unified Text-to-Text Transformer." *The Journal of Machine Learning Research* 21 (1): 140:5485-140:5551.

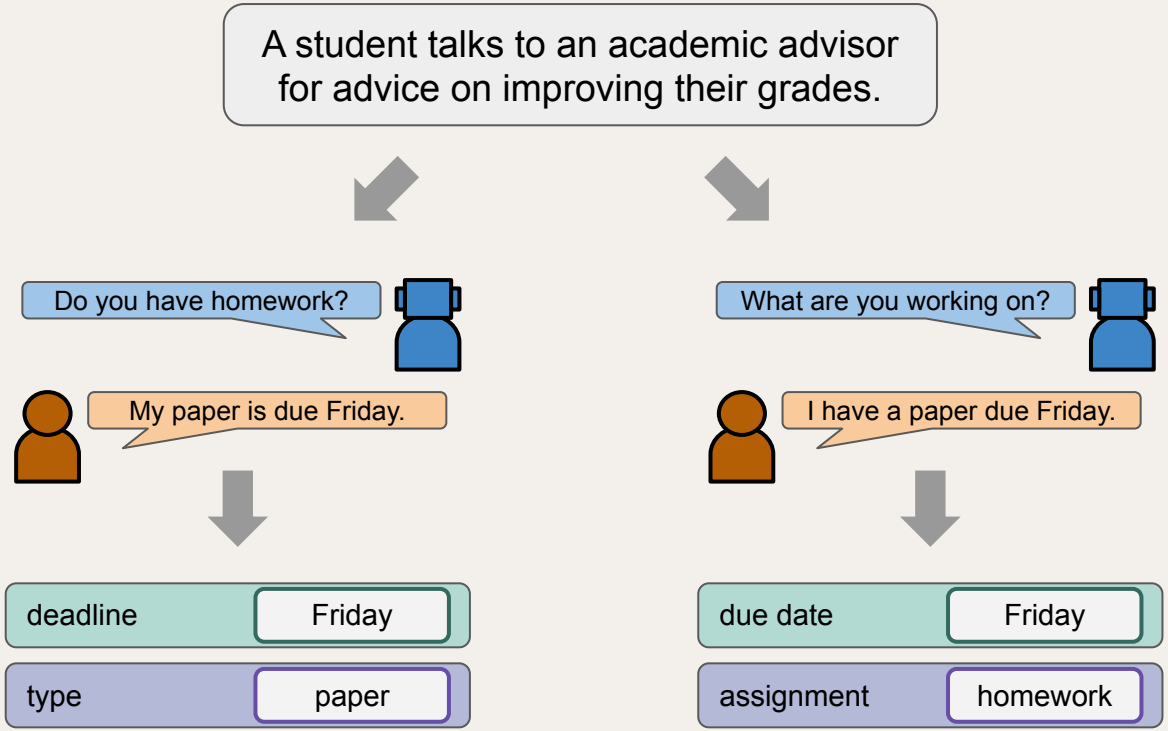
# Results - Correctness



# Results - Completeness



# Limitation: Schema Inconsistency



# Conclusion

- Domain-general inference of dialogue state
- Limitation: schema consistency
- Future work: resolve schema consistency
- Use DSG for generating diverse DST training data

# References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