

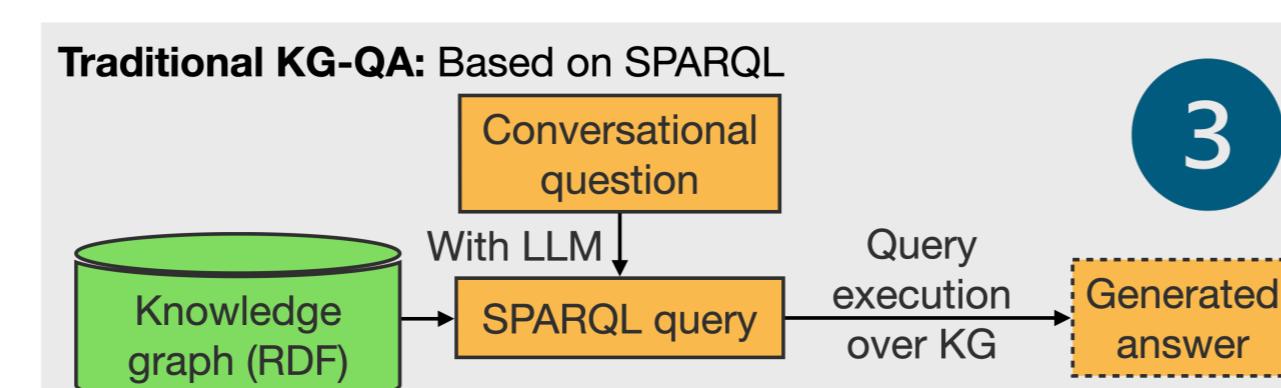
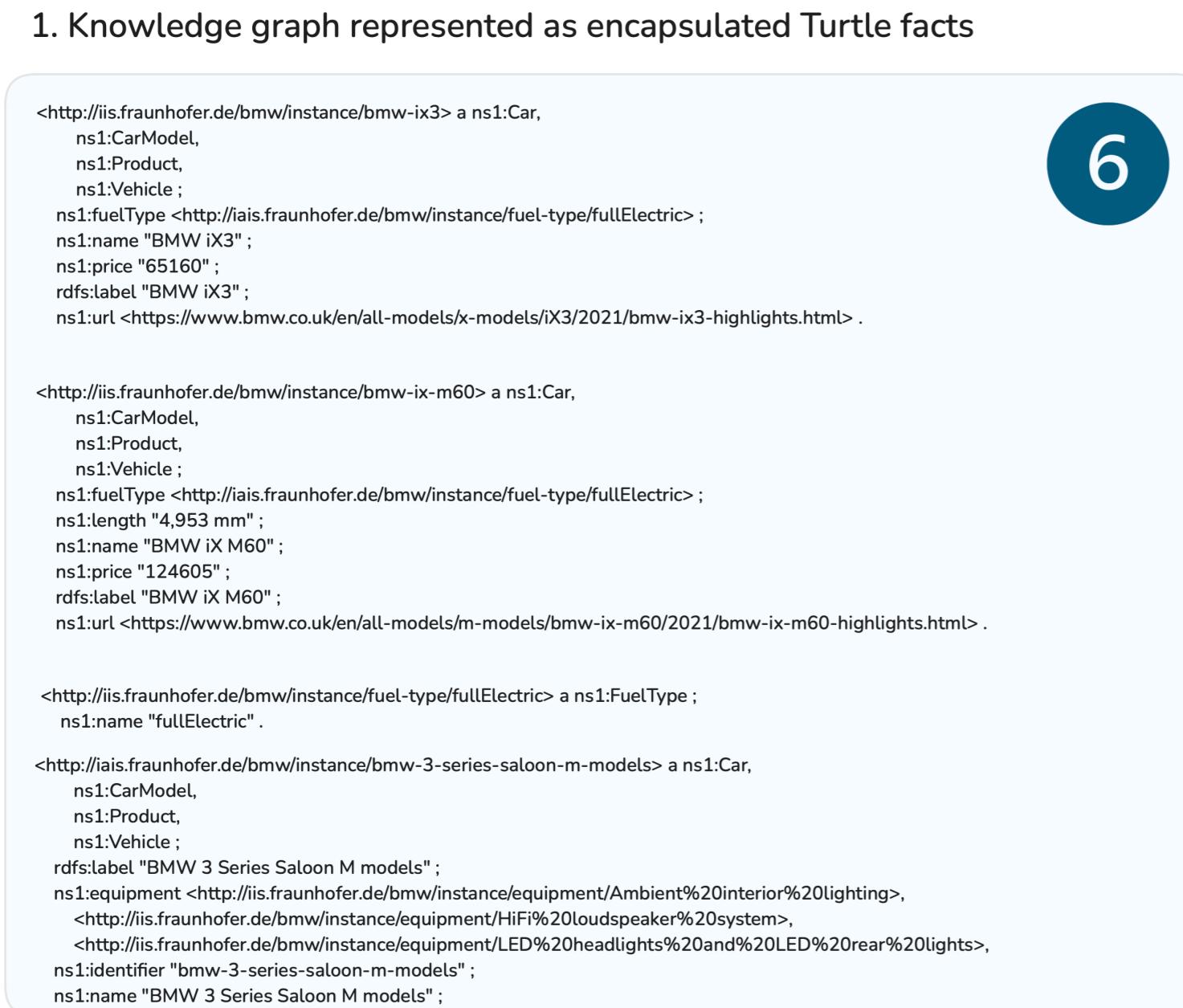
RAGONITE: Iterative Retrieval on Induced Databases and Verbalized RDF for Conversational QA over KGs with RAG



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1 Setup: Conversational question answering (ConvQA)

- | | |
|-------------------|---|
| Question 1 | What is the Coupe series all about? (Abstract intent) |
| Answer 1 | The BMW Coupe series is all about performance, luxury, and sporty design, offering a more ... |
| Question 2 | What fuel types does it support? (Lookup intent) |
| Answer 2 | BMW Coupes support multiple fuel types, depending on the variant. Here's a breakdown ... |
| Question 3 | Seems like sleek sedans. Do they have only rear wheel drive? (Lookup intent) |
| Answer 3 | No, BMW Coupes are not limited to rear-wheel drive. They also offer all-wheel drive ... |
| Question 4 | Can you tell me a bit about the transmission systems in Coupe models? (Lookup intent) |
| Answer 4 | BMW Coupe models come with a mix of automatic and manual transmissions ... |
| Question 5 | The Coupe models are sleek. Are these taller than an average X2 model? (Complex intent) |
| Answer 5 | No, BMW Coupe models are generally lower in height compared to the BMW X2 ... |

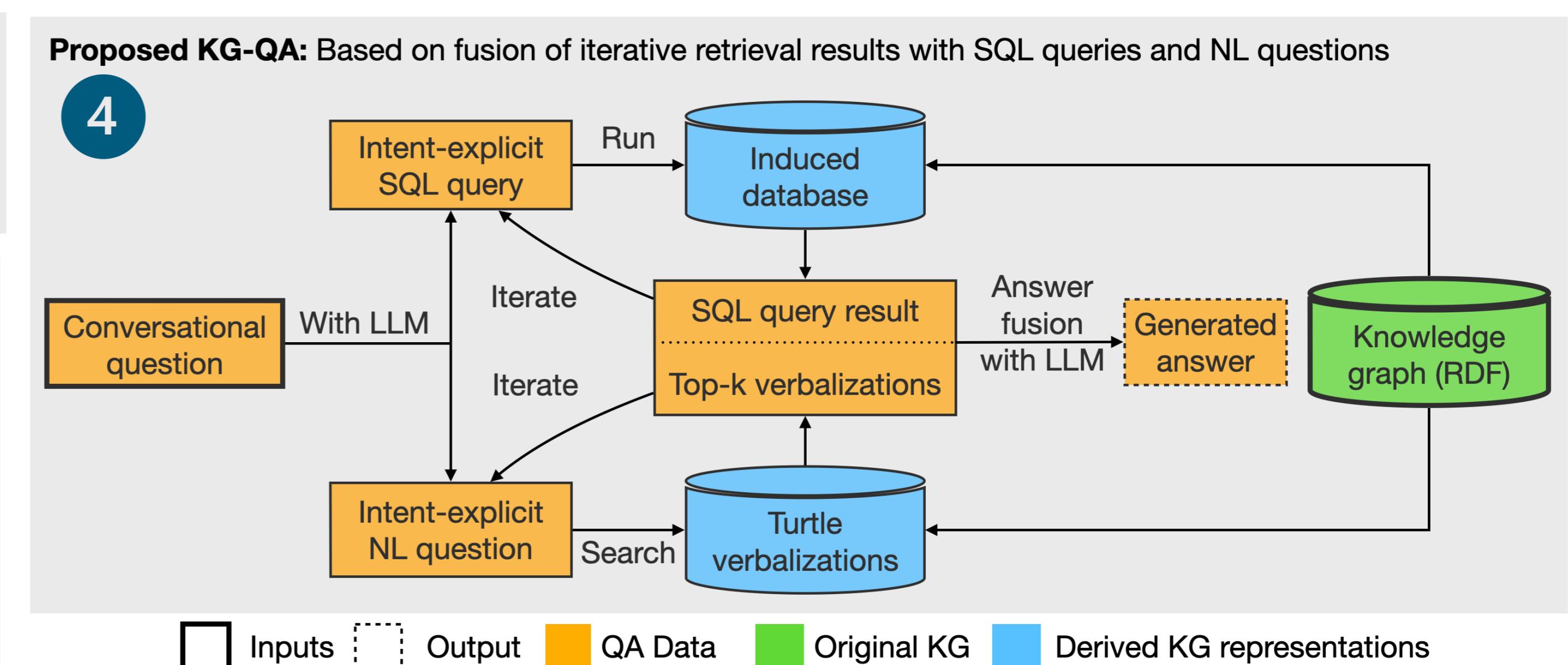


Unique features:

- Database induction
 - KG verbalization
 - Iterative retrieval
 - Branch integration
 - Open LLM support
 - Heterogeneous QA

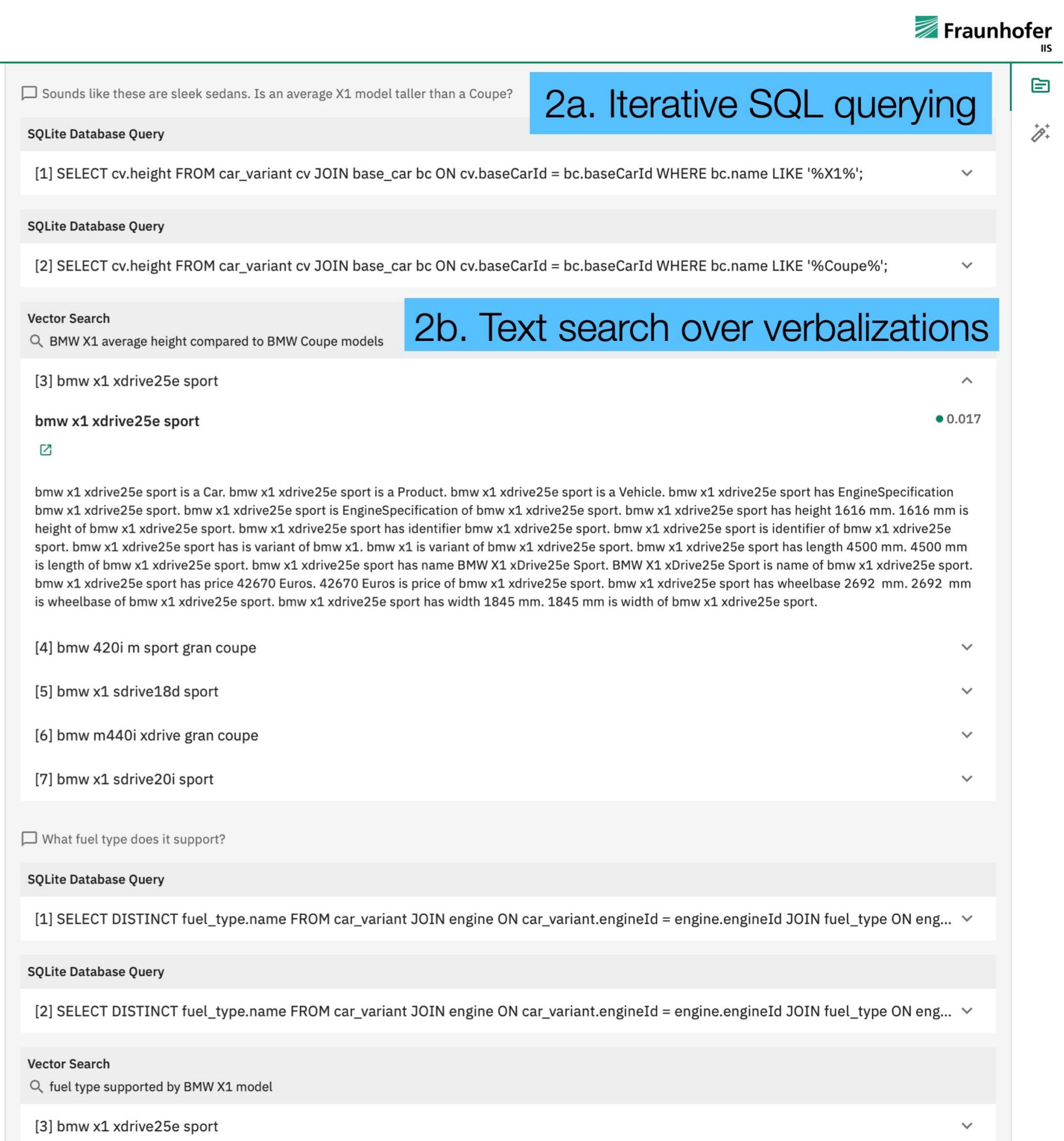
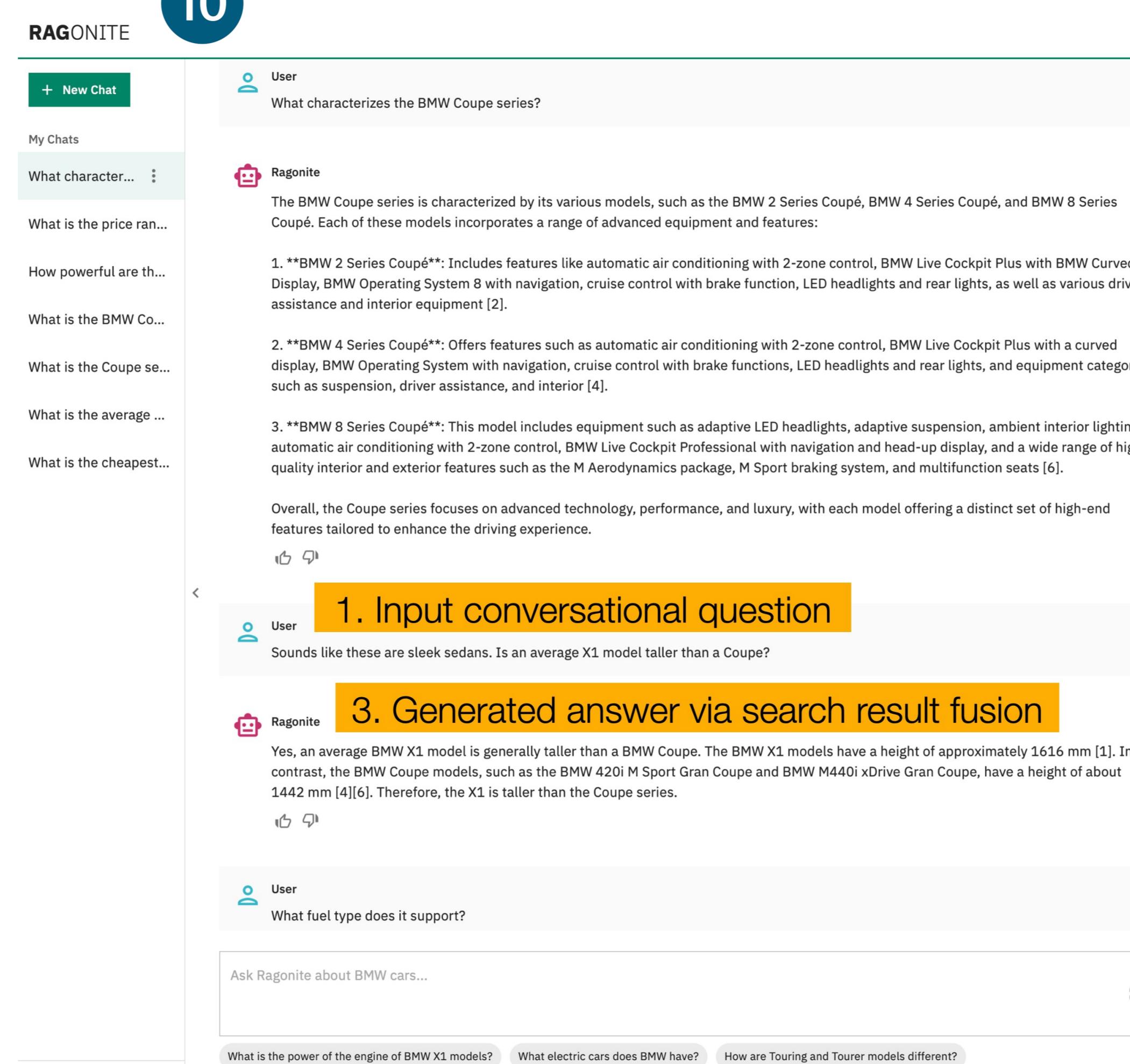
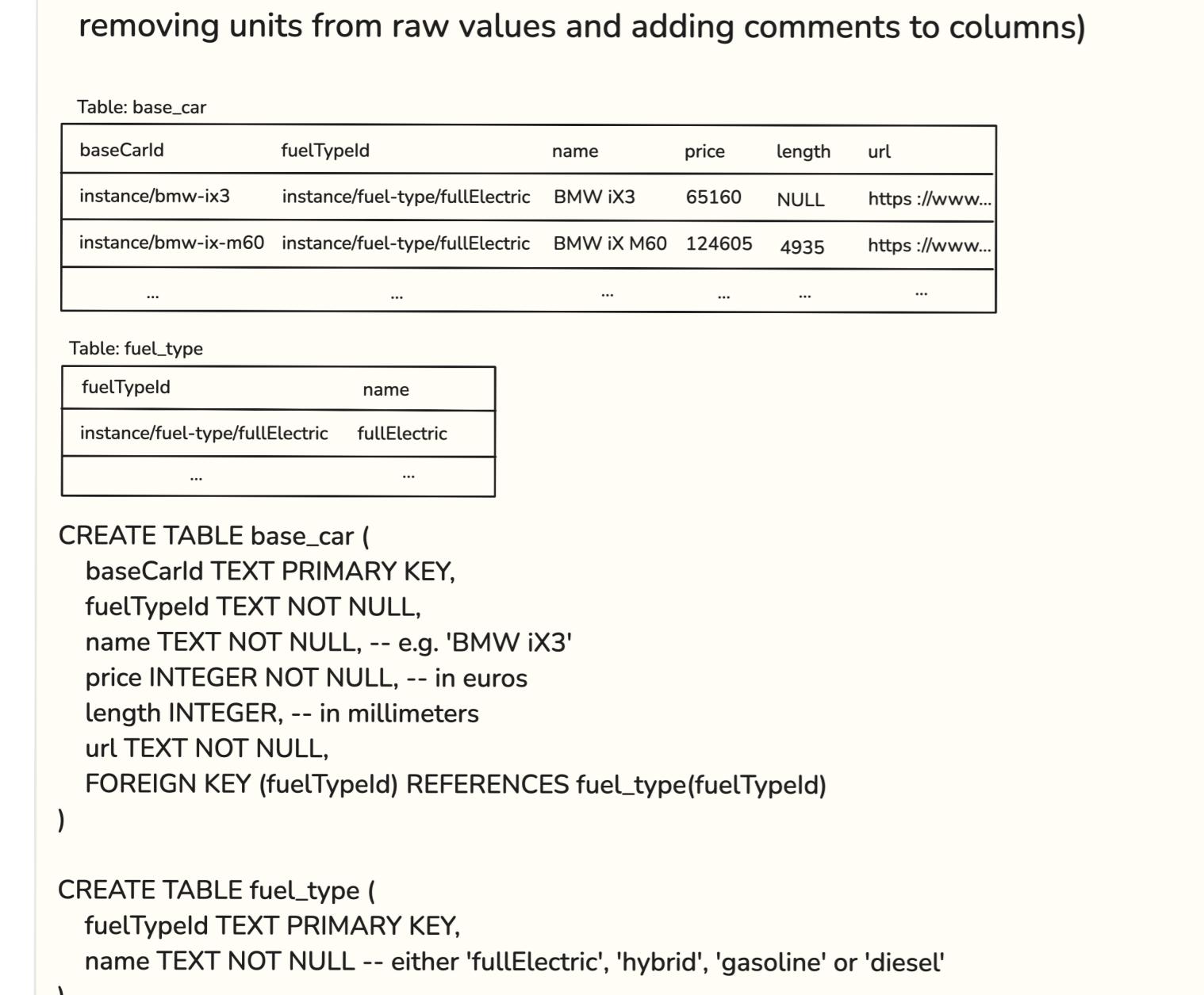
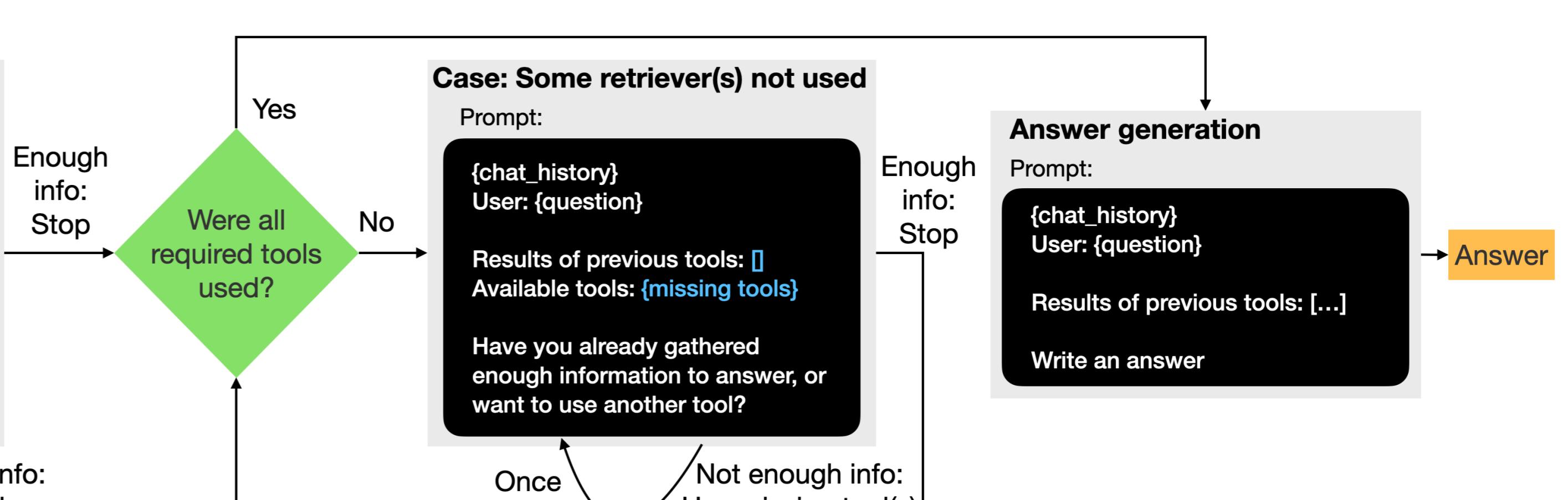
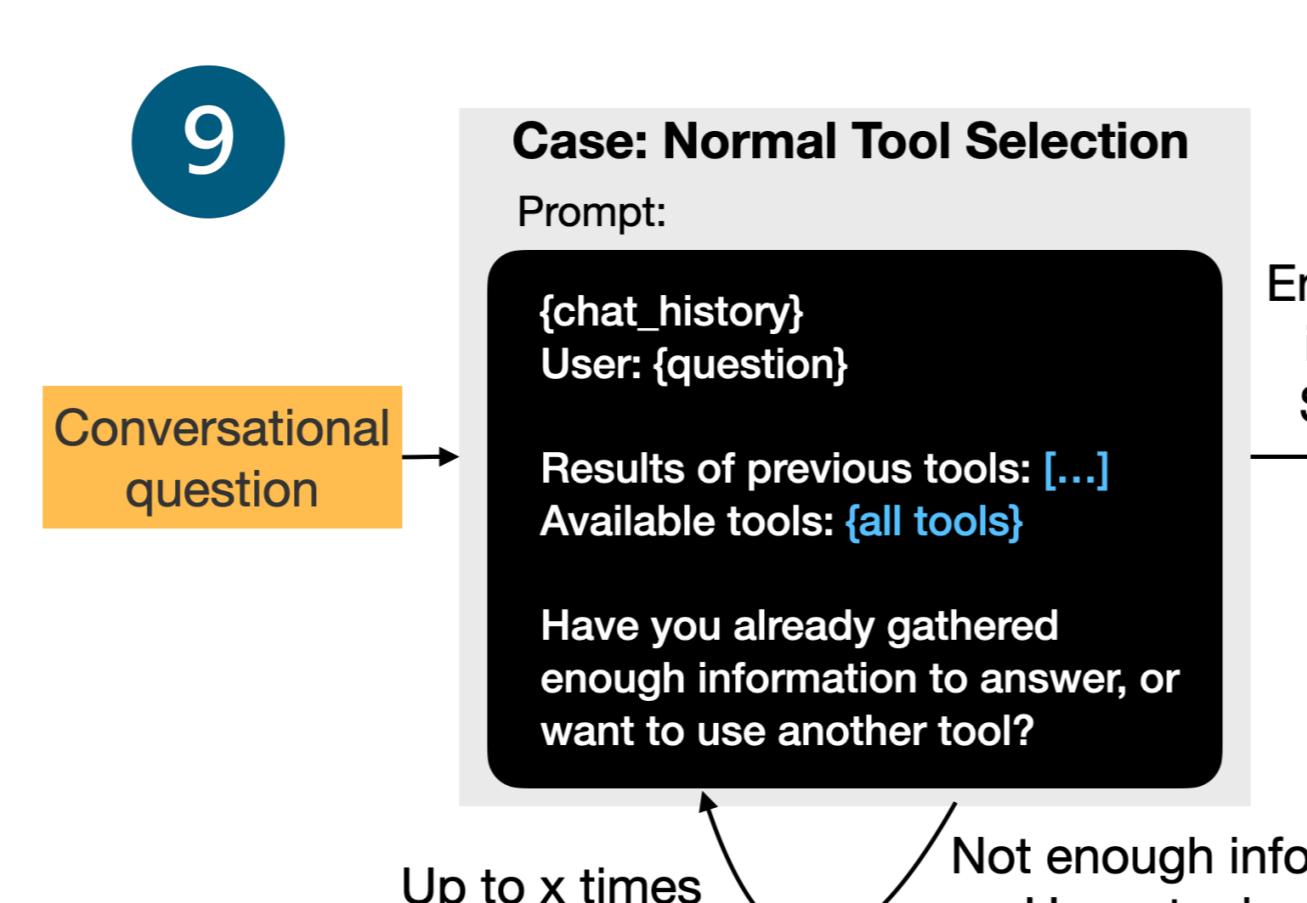


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<http://iis.fraunhofer.de/bmw/instance/variant/bmw-120-m-sport> a ns1:Car,  
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    ns1:Vehicle ;  
    rdfs:label "BMW 120 M Sport" ;  
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    ns1:height "1459 mm" ;  
    ns1:identifier "bmw-120-m-sport" ;  
    ns1:isVariantOf <http://iais.fraunhofer.de/bmw/instance/bmw-1-series-\(2024\)> ;  
    ns1:length "4361 mm" ;  
    ns1:name "BMW 120 M Sport" ;  
    ns1:price "33065" ;  
    ns1:wheelbase "2670 mm" ;  
    ns1:width "1800 mm" .  
  
<http://iis.fraunhofer.de/bmw/instance/variant/engine/bmw-218i-m-sport-gran-coupé> a ns1:EngineSpecification ;  
    ns1:WLTPCO2Emissionscombined "149 – 133 g/km" ;  
    ns1:WLTPConsumptioncombined "43.5 – 48.7 mpg" ;  
    ns1:acceleration062mph "9.2 s" ;  
    ns1:benefitInKind "31 – 34%" ;  
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    ns1:enginePerformance "100 kW (136 hp)" ;  
    ns1:fuelType <http://iais.fraunhofer.de/bmw/instance/fuel-type/gasoline> ;  
    ns1:transmission "Manual" .
```



Extended version on arXiv: <https://arxiv.org/abs/2412.17690>

All artifacts: <https://github.com/Fraunhofer-IIS/RAGonite>



Take-home message: Novel two-pronged approach with structured and unstructured retrieval can best harness the information present inside knowledge graphs