



Transient Tables: Evaluating LLMs' Reasoning on Temporally Evolving Semi-structured Tables



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Introduction

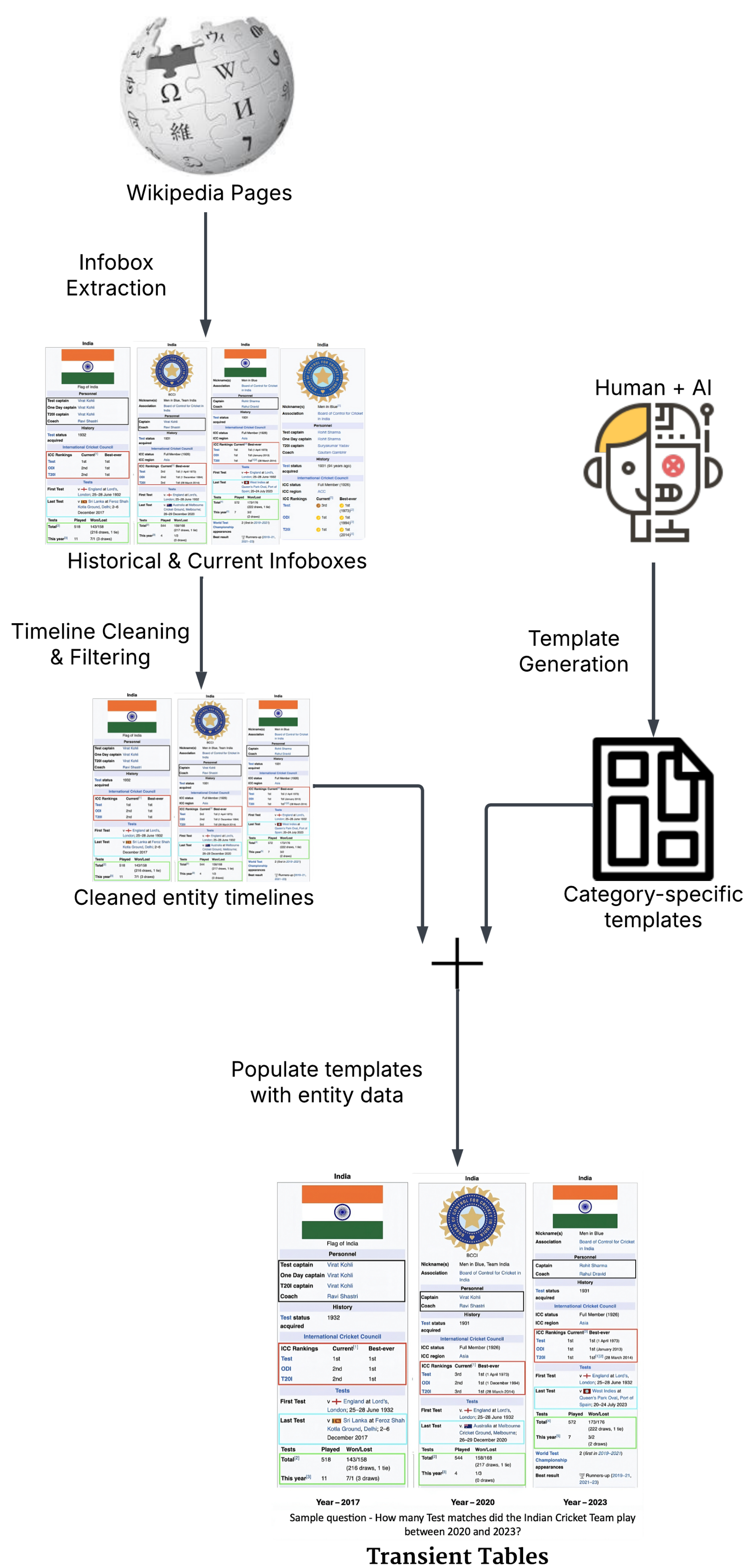
Information is inherently **transient** and **subject to periodic or non-periodic updates**. We present a QA dataset on temporally evolving information in tables.

Year – 2017	Year – 2020	Year – 2023
 Personnel Test captain Virat Kohli One Day captain Virat Kohli T20I captain Virat Kohli Coach Ravi Shastri History Test status acquired 1932 International Cricket Council ICC Rankings Current ⁽¹⁾ Best-ever Test 1st 1st ODI 2nd 1st T20I 2nd 1st Tests First Test v England at Lord's, London; 25–28 June 1932 Last Test v Sri Lanka at Feroz Shah Kotla Ground, Delhi; 2–6 December 2017 Tests Played Won/Lost Total ⁽²⁾ 518 143/158 (215 draws, 1 tie) This year ⁽³⁾ 11 7/1 (3 draws)	 Personnel Nickname(s) Men in Blue, Team India Association Board of Control for Cricket in India Personnel Captain Virat Kohli Coach Ravi Shastri History Test status acquired 1931 International Cricket Council ICC status Full Member (1926) ICC region Asia ICC Rankings Current ⁽¹⁾ Best-ever Test 3rd 1st (1 April 1973) ODI 2nd 1st (1 December 1994) T20I 3rd 1st (28 March 2014) Tests First Test v England at Lord's, London; 25–28 June 1932 Last Test v Australia at Melbourne Cricket Ground, Melbourne; 25–29 December 2020 Tests Played Won/Lost Total ⁽²⁾ 544 158/158 (217 draws, 1 tie) This year ⁽³⁾ 4 1/3 (0 draws)	 Personnel Nickname(s) Men in Blue Association Board of Control for Cricket in India Personnel Captain Rohit Sharma Coach Rahul Dravid History Test status acquired 1931 International Cricket Council ICC status Full Member (1926) ICC region Asia ICC Rankings Current ⁽¹⁾ Best-ever Test 1st 1st (1 April 1973) ODI 1st 1st (January 2013) T20I 1st 1st ⁽¹⁾⁽²⁾ (28 March 2014) Tests First Test v England at Lord's, London; 25–28 June 1932 Last Test v West Indies at Queen's Park Oval, Port of Spain; 20–24 July 2023 Tests Played Won/Lost Total ⁽²⁾ 572 173/176 (222 draws, 1 tie) This year ⁽³⁾ 7 3/2 (2 draws) World Test Championship appearances Best result Runners-up (2019–21, 2021–23)

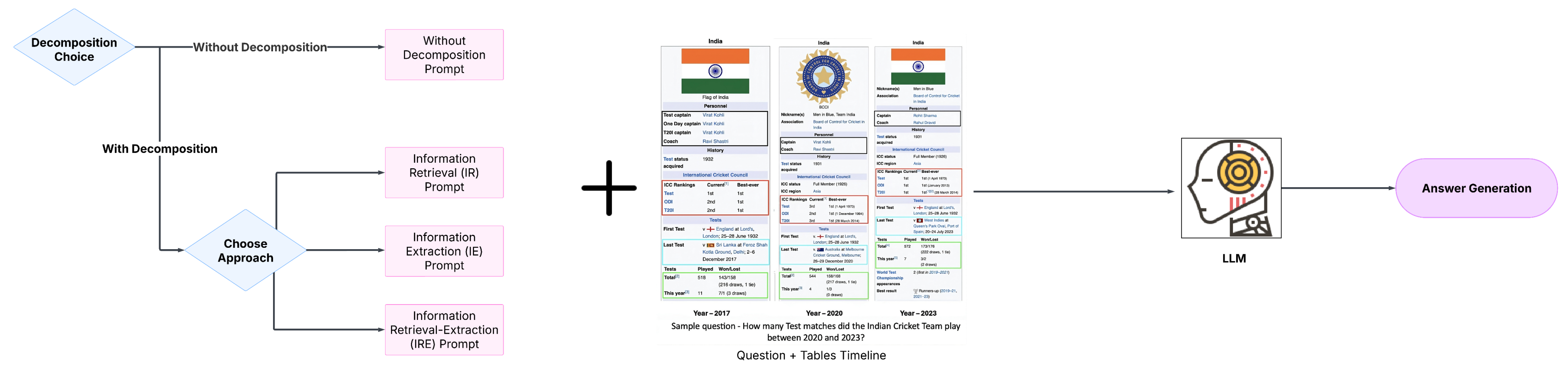
Sample question - How many Test matches did the Indian Cricket Team play between 2020 and 2023?

Dataset Creation

TRANSIENTTABLES contains **3,971 QA pairs** derived from over **14,000 tables**, spanning **1,238 entities** across multiple time periods.



Modelling Techniques



Task Decomposition Approaches:

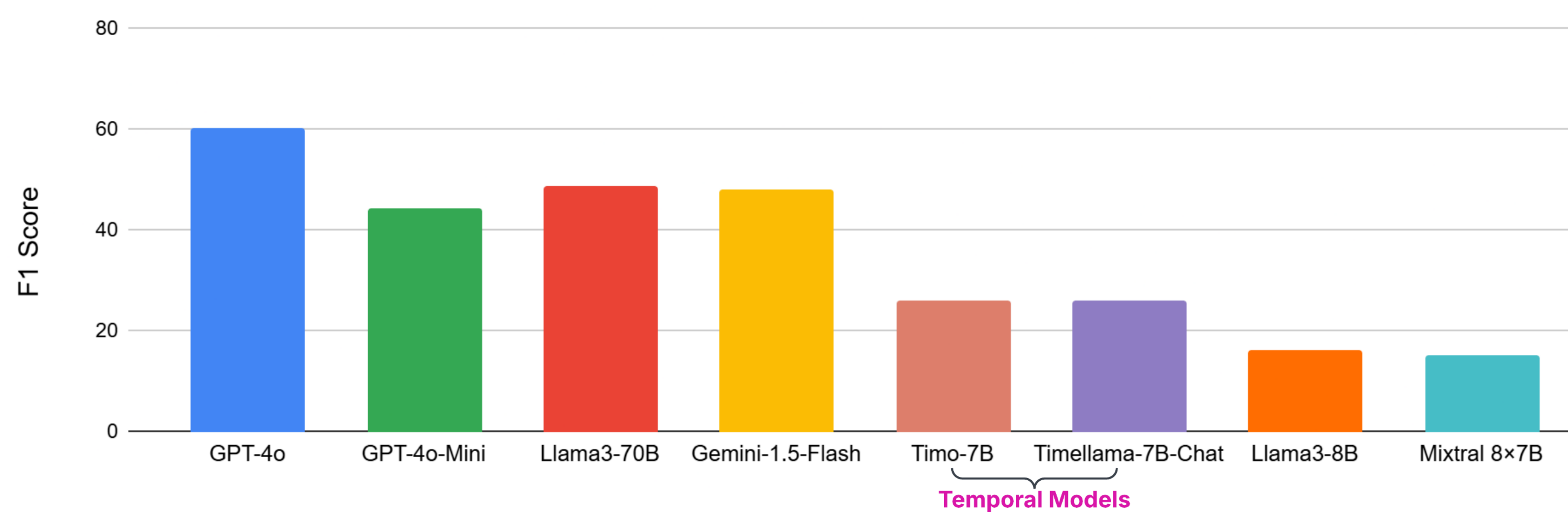
- Without Decomposition (**WD**): Direct answer generation
- Information Retrieval (**IR**): Table retrieval + Answer generation
- Information Extraction (**IE**): Key extraction + Answer generation
- Information Retrieval-Extraction (**IRE**): Table retrieval + Key extraction + Answer generation

Key Results



Breaking down the task improves performance.

Temporal Specific Models



Temporal-specific models show improvements but still trail behind larger general-purpose models

Future Work

- Extending to diverse structures beyond tables.
- Neuro-symbolic learning for interpretability.

References

- [1] TempTabQA: Temporal Question Answering for Semi-Structured Tables. Gupta et al., EMNLP 2023.
- [2] TIQ: A Benchmark for Temporal Question Answering with Implicit Time Constraints. Jia et al., WWW 2024.



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