



# MultiTabQA: Generating Tabular Answers for Multi-Table Question Answering

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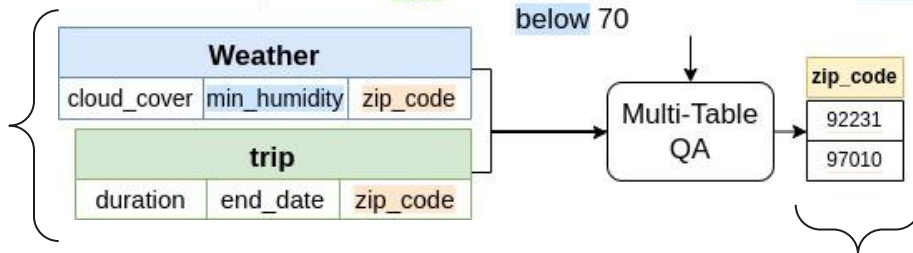
# Task Definition

```
SELECT zip_code FROM weather GROUP BY zip_code HAVING avg  
( mean_humidity ) < 70 INTERSECT  
SELECT zip_code FROM trip GROUP BY zip_code HAVING count ( * ) >= 200
```

What is the zip code of **trips** made which are above 200 with **humidity**  
**below 70**

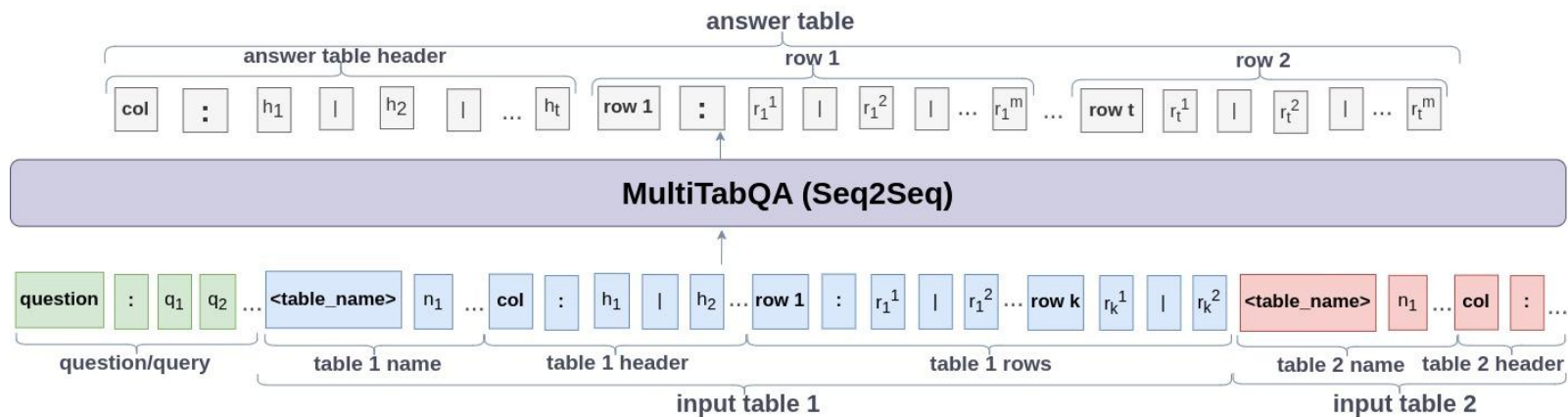
} Natural language question

Multiple input  
tables

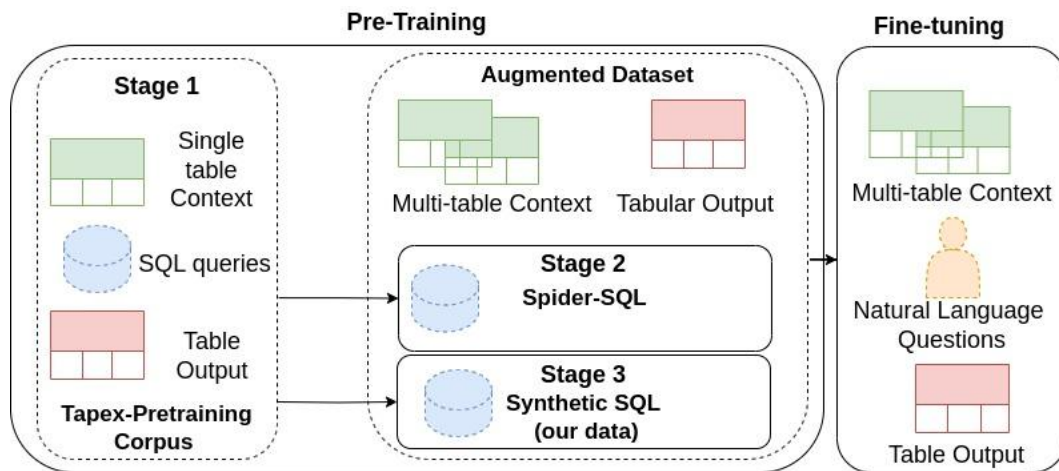


Tabular Answer

# Architecture



# Multi-Stage Curriculum Learning



# Examples

- ▶ **Success Case:** how many likes does kyle have?

Input Tables:

highschooler		
id	name	grade
1510	jordan	9
...	...	...
<b>1934</b>	<b>kyle</b>	12
1661	logan	12

likes	
student_id	like_id
1689	1709
...	...
1501	<b>1934</b>
<b>1934</b>	1501

target:

count(*)
1

and prediction:

count(*)
1

- ▶ **Failure Case:** find the average weight for each pet type.

Input Table:

PetID	PetType	pet_age	weight
2001	cat	3	12.0
2002	dog	2	13.4
2003	dog	1	9.3

target:

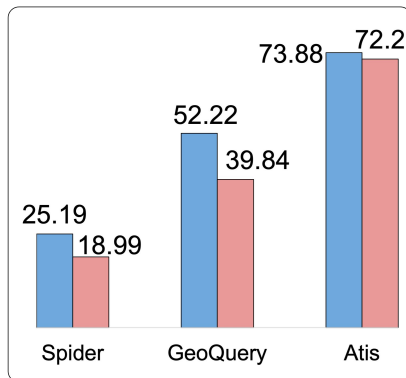
avg(weight)	PetType
12.0	cat
11.35	dog

prediction:

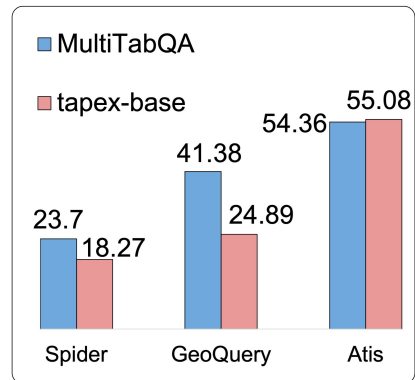
PetType	avg(weight)
cat	12.0
dog	13.4

# Results

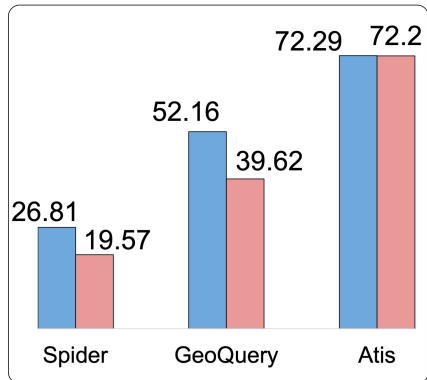
### Table Exact Match Accuracy



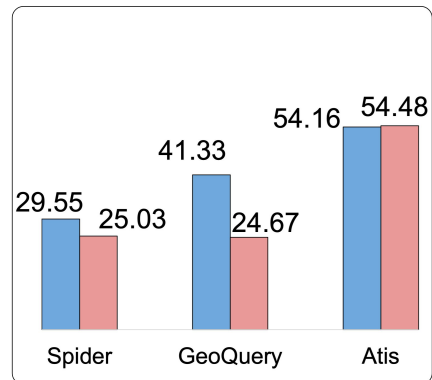
### Row Exact Match F1



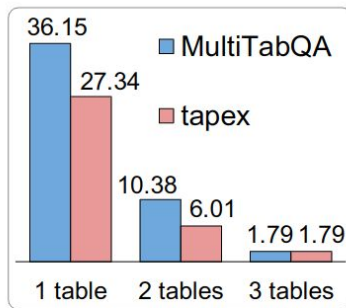
### Column Exact Match F1



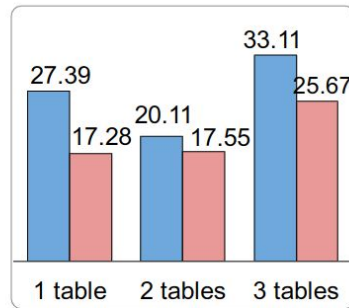
### Cell Exact Match F1



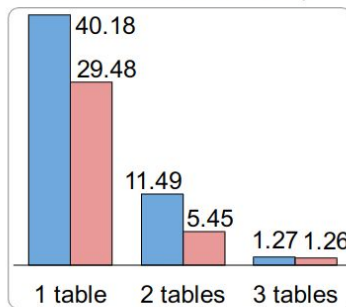
# Ablation on number of input tables



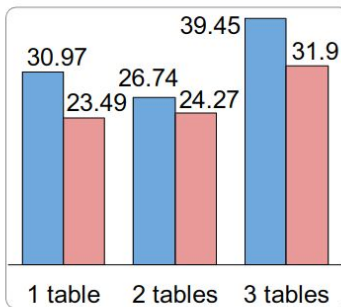
(a) Table EM Accuracy



(b) Row EM F1



(c) Column EM F1



(d) Cell EM F1

# Take-Away

- Multi-table QA aims to answer questions over multiple tabular context and generates a table as a result.
- The task pose additional challenges to end-to-end table QA systems by increasing question complexity.
- Question complexity is due to multi-table mathematical and table operations.
- Arithmetic operations pose a challenge
- Code and data: <https://github.com/kolk/MultiTabQA>

