

## Motivation

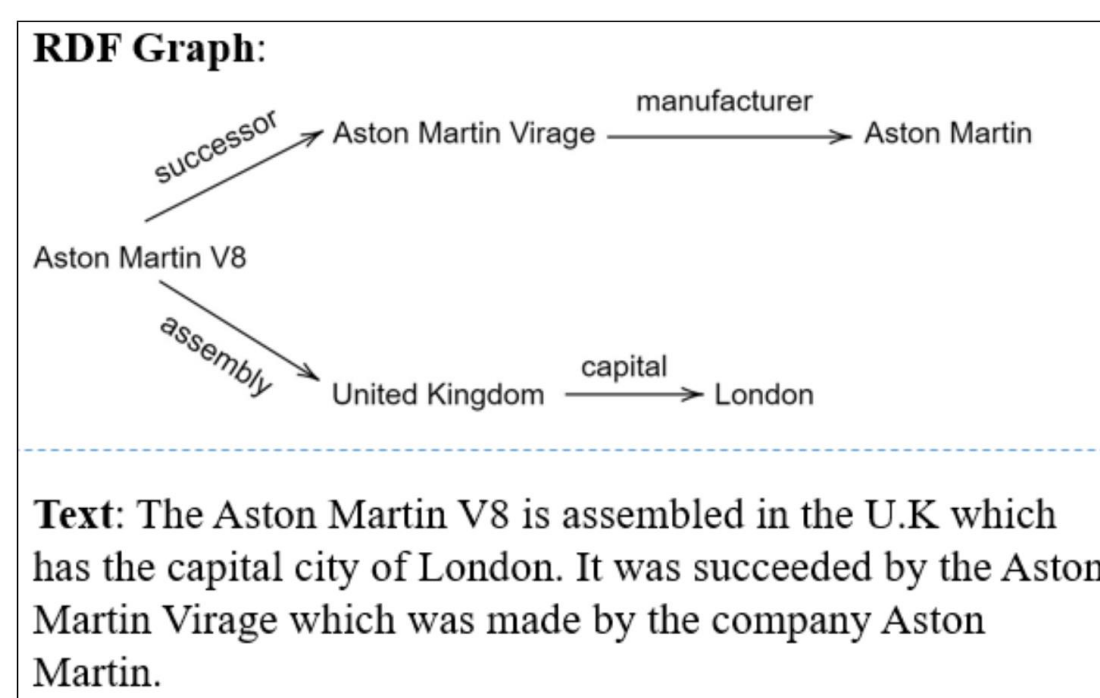
- Automatically generating textual description from structured input is crucial to improving accessibility of database to lay users.
- As Data-to-text generation garnered increasing attention in recent years, effort in both dataset and model development have been driving progress in this field.
- Yet, existing datasets mostly deals with generating paragraph from multiple record input or only focus on a small number of domains, and factual consistency with the database record is not considered.

## Our Contribution

In our work, we focus on providing a large, open domain corpus, with each input being asemantic tuple from a database record, annotated with sentence description that covers all facts in the tuple and attends to information from the table schema and title.

## Related Datasets and Work

- WebNLG corpus (Gardent et al., 2017a), presented a semiautomatic framework for microplanning and knowledge base verbalization.



- Neural Wikipedian (Vougiouklis et al., 2018) loosely aligned a large set of data triples in DBpedia and Wikidata with Wikipedia biographies

<b>Triples</b>	dbr:Walt_Disney dbo:birthDate "1901-12-05" dbr:Walt_Disney dbo:birthPlace dbr:Chicago dbr:Mickey_Mouse dbo:creator dbr:Walt_Disney
<b>Textual Summary</b>	Walt Disney was born in Chicago, and was the creator of Mickey Mouse.

## Related Datasets and Work

- the E2E Dataset (Duseket al., 2018) focused on the restaurant domain with rich syntactic structure and lexical choices

Flat MR	NL reference
name[Loch Fyne], eatType[restaurant], food[French], priceRange[less than £20], familyFriendly[yes]	Loch Fyne is a family-friendly restaurant providing wine and cheese at a low cost.
	Loch Fyne is a French family friendly restaurant catering to a budget of below £20.
	Loch Fyne is a French restaurant with a family setting and perfect on the wallet.

- WikiTableQuestions (Pasupat et al., 2016)

Year	City	Country	Nations
1896	Athens	Greece	14
1900	Paris	France	24
1904	St. Louis	USA	12
...	...	...	...
2004	Athens	Greece	201
2008	Beijing	China	204
2012	London	UK	204

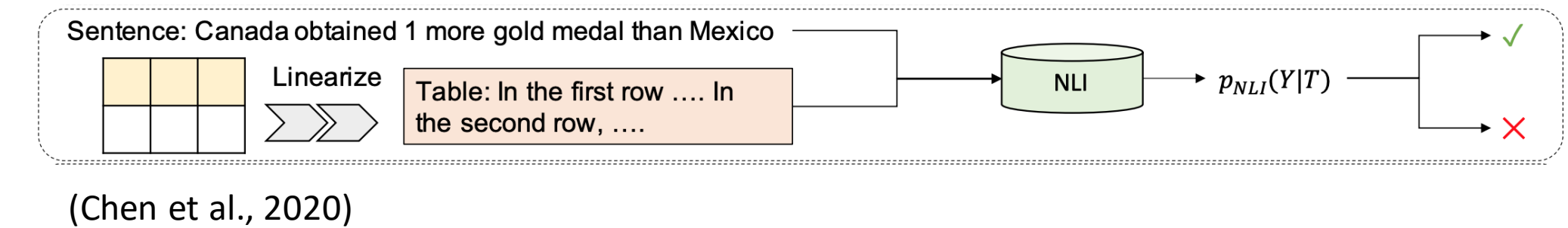
$x = \text{Greece held its last Summer Olympics in which year?}$   
 $y = 2004$

## Our Annotations

<https://ppasupat.github.io/WikiTableQuestions/viewer/#203-752>

Rank	Circuit	Headquarters	Screens	Sites	
1	Regal Entertainment Group	Knoxville, TN	7,318	574	Regal Entertainment Group is based in Knoxville, TN.
2	AMC Entertainment Inc	Kansas City, MO	4,988	344	AMC Entertainment Inc operates 4,988 screens across 344 sites.
3	Cinemark Theatres	Plano, TX	4,434	332	Headquartered in Plano, TX, Cinemark Theatres operates 332 sites.
4	Carmike Cinemas, Inc.	Columbus, GA	2,476	249	Carmike Cinemas, Inc. operates 249 sites.
5	Cineplex Entertainment	Toronto, ON	1,672	136	The Cineplex Entertainment movie chain., based in Toronto, ON, has 1672 screens
6	Marcus Theatres	Milwaukee, WI	687	55	Marcus Theaters is headquartered in Milwaukee, WI.
7	Harkins Theatres	Phoenix, AZ	440	31	Harkins Theatres, based in Phoenix, AZ, has 440 screens and 31 sites.
8	National Amusements	Dedham, MA	423	32	National Amusements has 423 screens and 32 sites.
9	Bow Tie Cinemas	Ridgefield, CT	388	63	Bow Tie Cinemas has 388 screens.
10	Georgia Theatre Company	St. Simon's Island	326	32	Georgia Theatre Company, headquartered in St. Simon's Island, GA, has 32 sites.

## Metrics of Semantic Factual Consistency



## Model Improvement and Long-Term Ideas

- Aggregation
- Combine Generation and Parsing (similar to back translation)
- Use External Data
- Pretrained Language Models (e.g., BART)

## Current SOTA Experimental Results

	BLEU			METEOR			TER		
	SEEN	UNSEEN	ALL	SEEN	UNSEEN	ALL	SEEN	UNSEEN	ALL
GTR-LSTM (Distiawan et al., 2018)	54.00	29.20	37.10	0.37	0.28	0.31	0.45	0.60	0.55
GCN-EC (Marcheggiani and Perez-Beltrachini, 2018)	55.90	-	-	0.39	-	-	0.41	-	-
GRU (Castro Ferreira et al., 2019)	56.09	25.12	42.73	0.42	0.22	0.33	0.39	0.64	0.51
Transformer (Castro Ferreira et al., 2019)	56.28	23.04	42.41	0.42	0.21	0.32	0.39	0.63	0.50
Step-by-Step (Moryossef et al., 2019)	53.30	34.41	47.24	0.44	0.34	0.39	0.47	0.56	0.51
PlanEnc (Zhao et al., 2020)	64.42	38.23	52.78	0.45	0.37	0.41	0.33	0.53	0.42
DualEnc (Zhao et al., 2020)	63.45	36.73	51.42	0.46	0.37	0.41	0.34	0.55	0.44

Table 1: WebNLG 2017 Challenge Results.

System	BLEU	NIST	METEOR	R-L	CIDER
T-Gen	65.93	8.61	44.83	68.50	2.23
Best Prev.	66.19 <sup>†</sup>	8.61 <sup>†</sup>	45.29 <sup>‡</sup>	70.83 <sup>◊</sup>	2.27 <sup>*</sup>
$S_0$	66.52	8.55	44.45	69.34	2.23
$S_0 \times 2$	65.93	8.31	43.52	69.58	2.12
$S_1^R$	<b>68.60</b>	<b>8.73</b>	<b>45.25</b>	<b>70.82</b>	<b>2.37</b>
$S_1^D$	67.76	8.72	44.59	69.41	2.27

Table 1: Test results for the E2E generation task, in (Shen et al., 2019)