fabrahman/ReBART

Is Everything in Order?
A Simple Way to Order Sentences

Somnath Basu Roy Chowdhury*, Faeze Brahman*, Snigdha Chaturvedi
somnath@cs.unc.edu   fbrahman@ucsc.edu   snigdha@cs.unc.edu
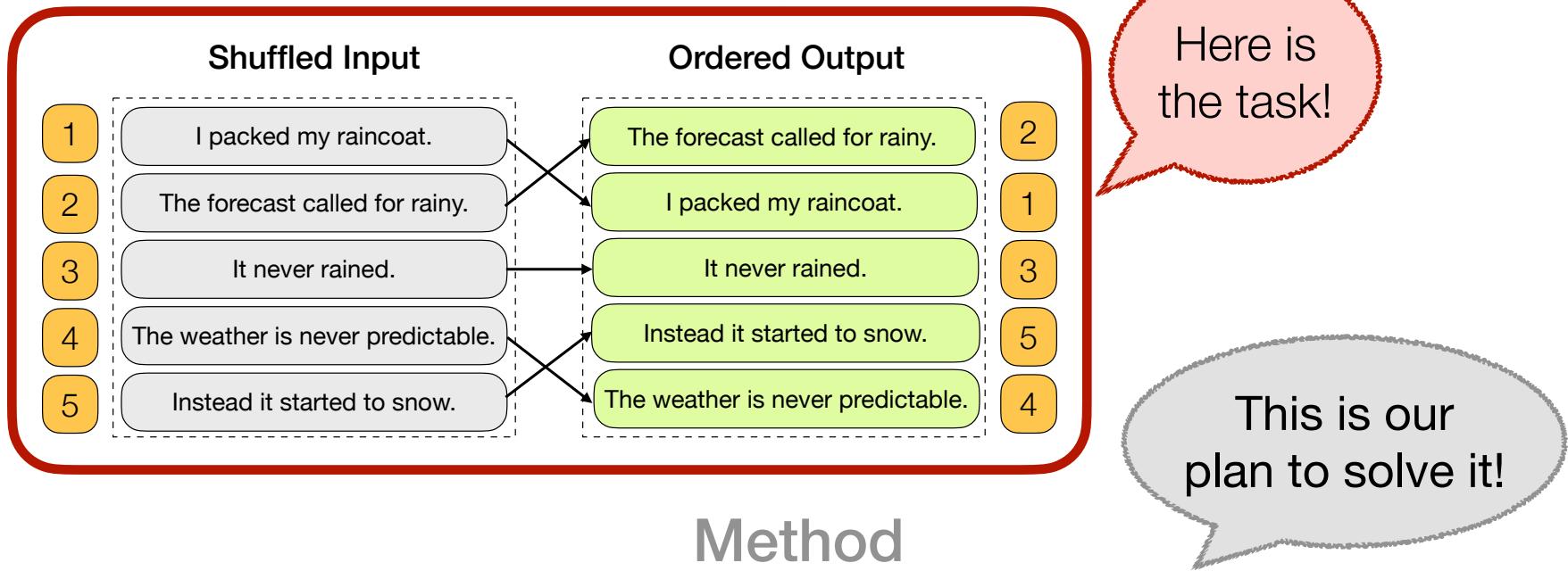
UNC NLP

Baskin Engineering UC SANTA CRUZ

Sentence Ordering

Here is the task!

Shuffled Input

1. I packed my raincoat.
2. The forecast called for rainy.
3. It never rained.
4. The weather is never predictable.
5. Instead it started to snow.

Ordered Output

2. The forecast called for rainy.
1. I packed my raincoat.
3. It never rained.
5. Instead it started to snow.
4. The weather is never predictable.

This is our plan to solve it!

Method
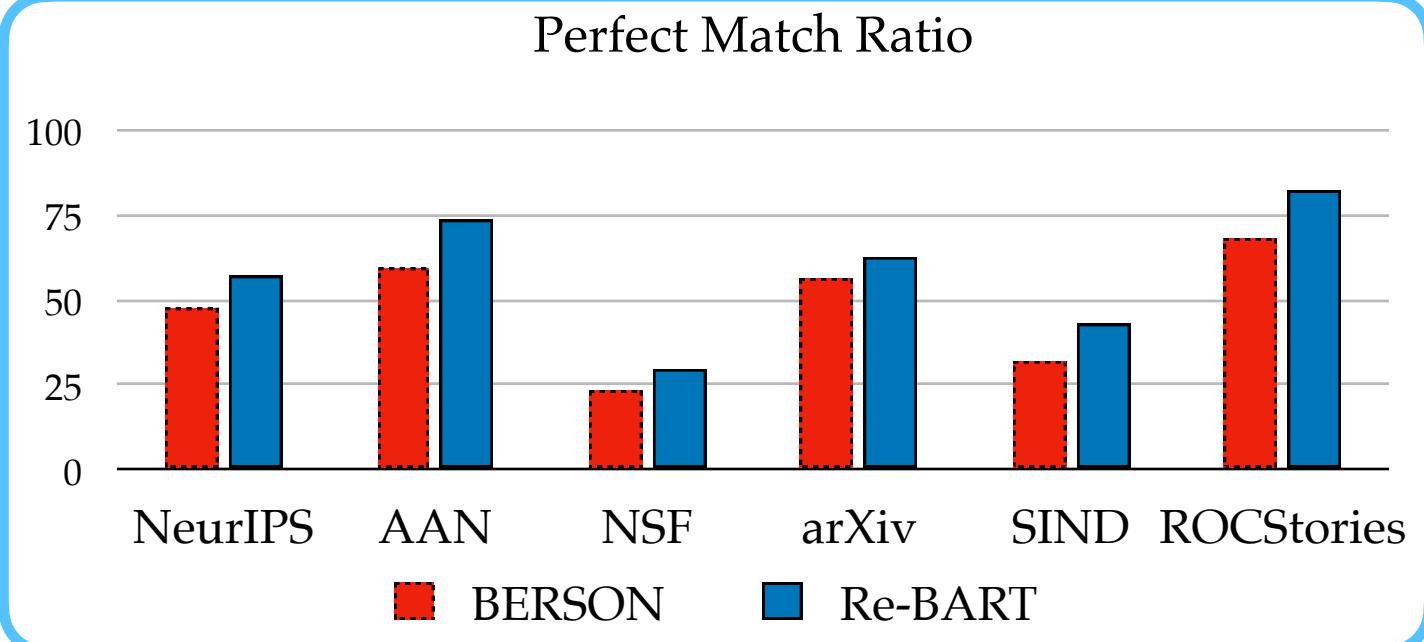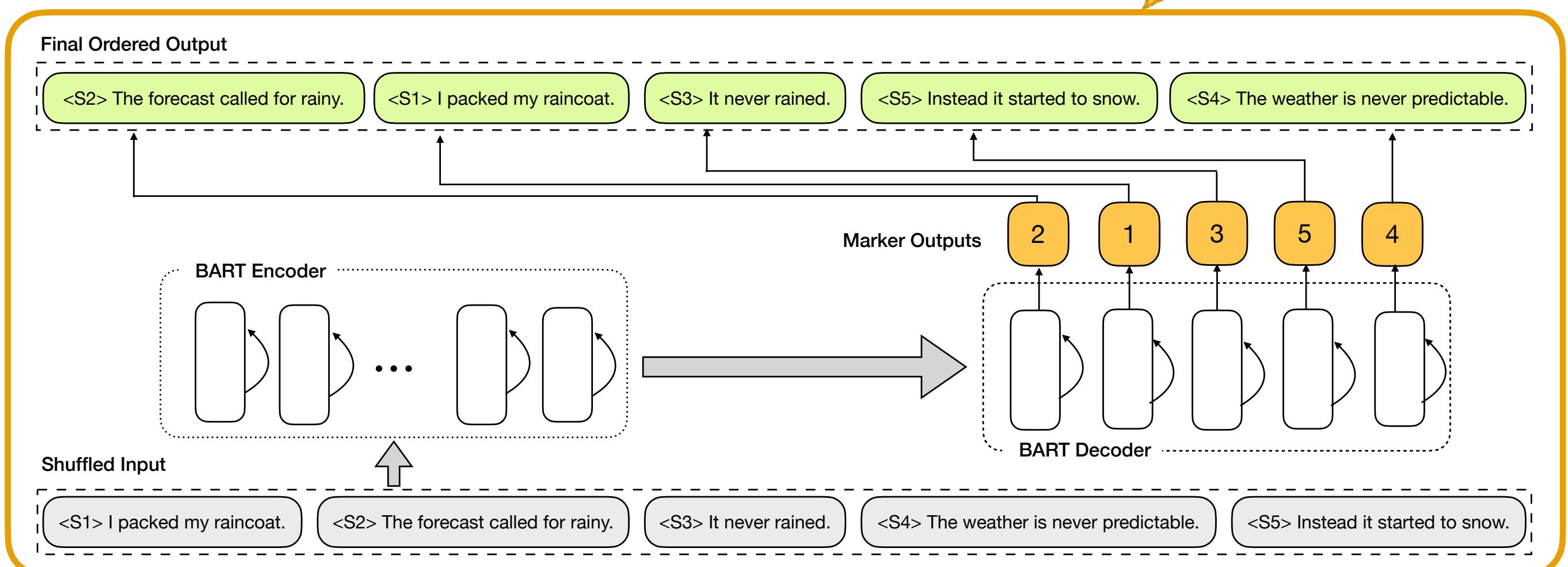
- We solve sentence ordering in a **text generation** setup
- We append shuffled sentences with **marker tokens**
- We except marker positions in the correct order
- We experiment with different types of markers and vary other input features to investigate model performance

Re-BART

This is the overall framework!

Final Ordered Output

| <S2> The forecast called for rainy. | <S1> I packed my raincoat. | <S3> It never rained. | <S5> Instead it started to snow. | <S4> The weather is never predictable. |

Marker Outputs: 2 1 3 5 4

BART Encoder ... **BART Decoder**

Shuffled Input

| <S1> I packed my raincoat. | <S2> The forecast called for rainy. | <S3> It never rained. | <S4> The weather is never predictable. | <S5> Instead it started to snow. |

Results

How did Re-BART perform?

Perfect Match Ratio

BERSON   Re-BART

(NeurIPS, AAN, NSF, arXiv, SIND, ROCStories)
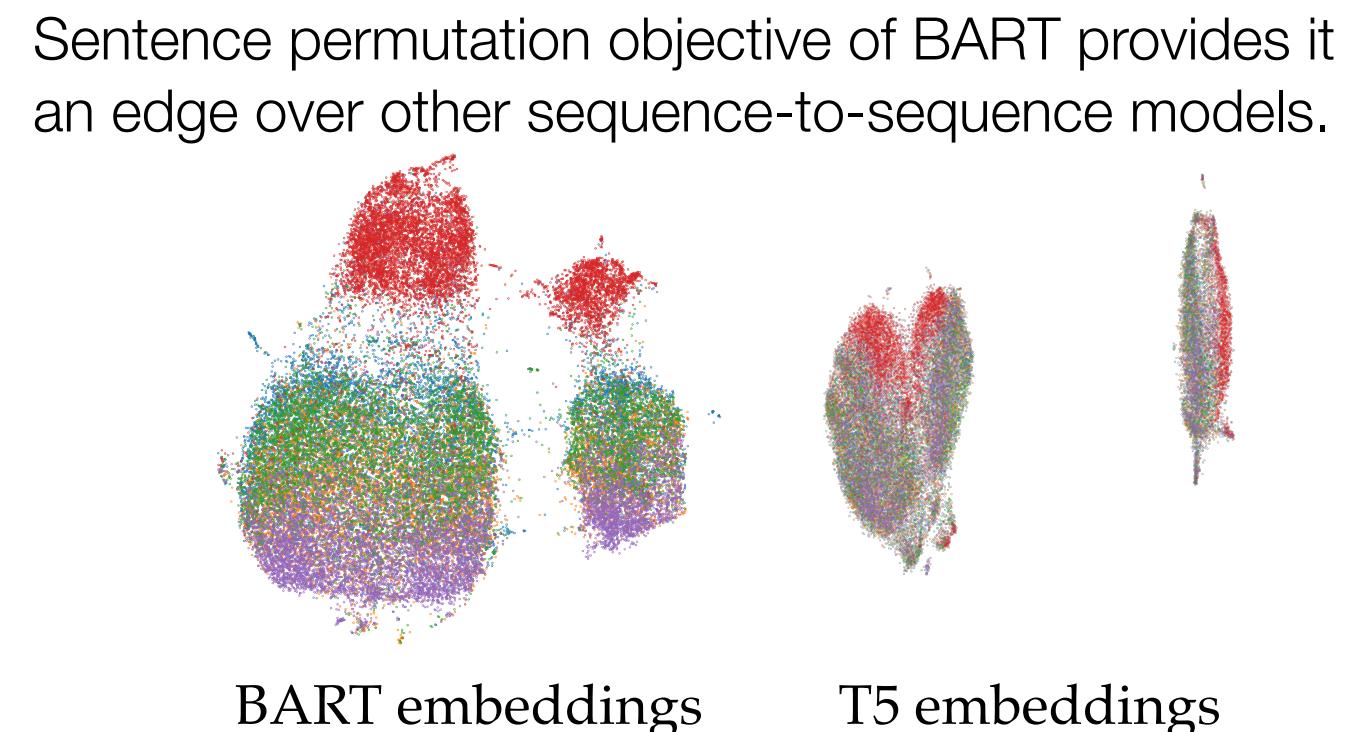
What factors affect Re-BART's performance?

Here are the takeaway points!

BART vs. T5

Why did we choose BART?

Sentence permutation objective of BART provides it an edge over other sequence-to-sequence models.

BART embeddings   T5 embeddings

Analysis

- Performance **decreases** with degree of shuffling
- Performance **peaks** for starting and ending sentences
- Prediction displacement is **small** for most instances
- Sentence displacement has **no** effect on performance

Conclusion

- Cast sentence ordering as conditional **text-to-marker** generation problem and introduce Re-BART
- Relative gain of 11-36% in PMR over SOTA
- Exhaustive analysis shows Re-BART is sensitive to certain factors like shuffling and input length
- We achieve **SOTA** on 7 datasets (paper abstracts & narratives)