Conversational Question Answering- QReCC Shared task

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Outline

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The Task

The Task

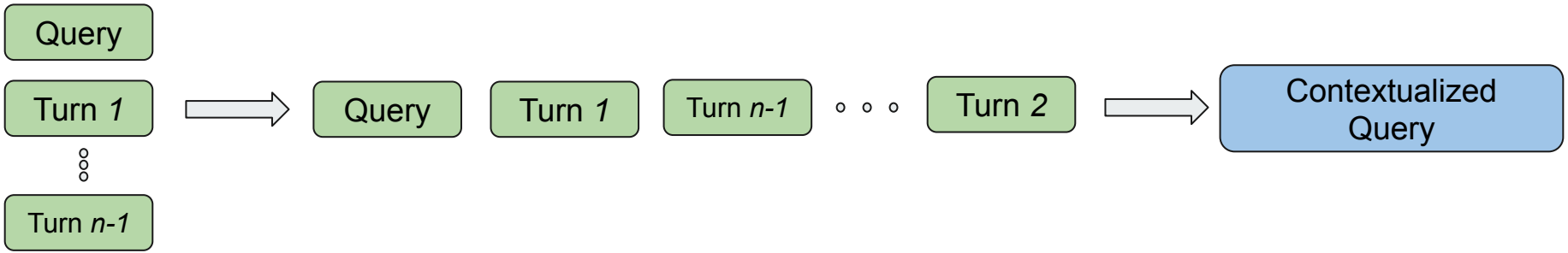
Definition

- Given a collection of web pages the task is to :
  - retrieve the top k passages that can answer the next question
  - while correctly interpreting the question in the context of the previous conversation.

Approach

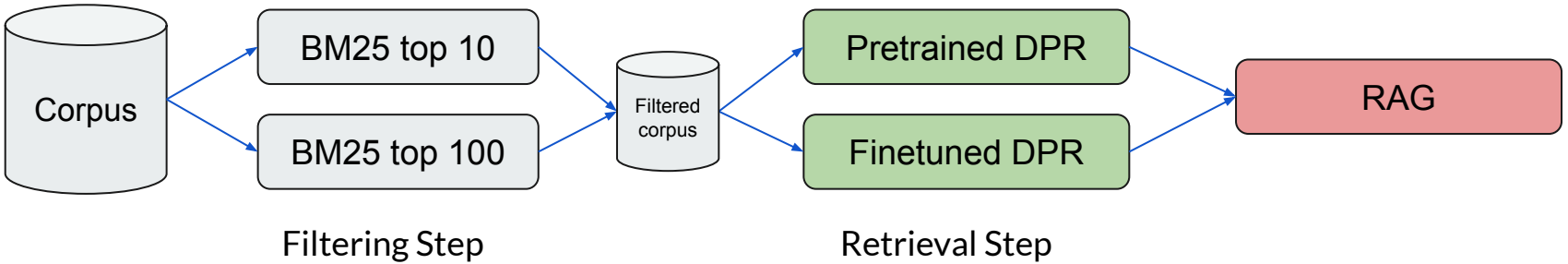
BART for Query Rewriting

- Conditional language generation problem
- BART (seq2seq) model to generate rewritten question, given context as input
- Contextualizing the query:



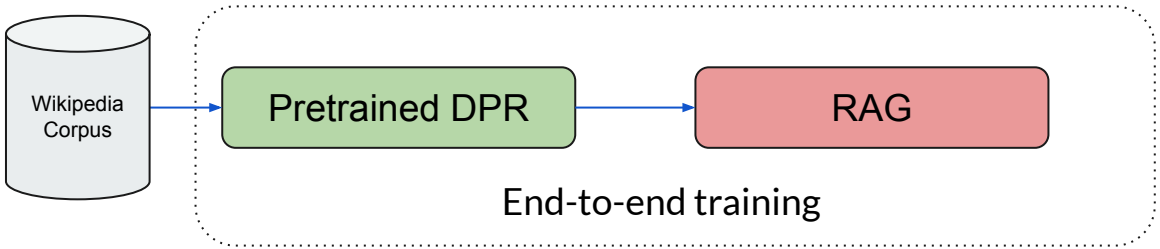
RAG with BM25 Filtering

- Two step solution to handle corpus scale issue



RAG with Wiki Index

- Use Wikipedia corpus instead of the QReCC corpus
- Advantages:
  - Corpus smaller than the original corpus
  - Index publicly available



Results

Question Rewriting

Model	Rouge1 Recall
Baseline	0.571
BART	0.700*

*Score was calculated locally. It did not appear on the leaderboard.

Models

Setup (Filtering)	Queries	Model	Retriever	F1 Score	EM
Baseline				0.224	0.000
BM25 top 1	Gold	BART	BM25	0.019	0.000
BM25 top 10	BART	RAG	Fine-tuned DPR	0.183	0.001
BM25 top 10	Gold	RAG	Pretrained DPR	0.224	0.012
BM25 top 100	Gold	RAG	Pretrained DPR	0.176	0.006
BM25 top 10	Gold	RAG	Fine-tuned DPR	**0.261**	**0.015**
Wiki Index	Gold	RAG	Pretrained DPR	0.230	0.014

Challenges Faced

Challenges

- Full passage collection too large for RAG/DPR
  - Generating Embeddings
    - Parallelized across multiple GPUs
    - 40 hours per GPU on 8 GPUs
  - Creating Dense Index
    - Couldn’t scale dense index creation
- The answers are comprehensive and non-compact
- Modelling long sequences
  - Conversational context
  - Passages

Thank you!

Questions?

References

- R. Anantha et.al., Open Domain Question Answering Goes Conversational Via Question Rewriting
- P.Lewis et.al., Retrieval-Augmented Generation for Knowledge-Intensive NLP Tasks
- M.Lewis et.al., Denoising sequence-to-sequence pretraining for Natural Language Generation, Translation and Comprehension
- V. Karpukhin et.al., Dense Passage retrieval for Open Domain question Answering