Chain-of-Questions (For Multistep Question Answering)

Instructor

Bhaskarjit Sarmah

Vice President, Blackrock
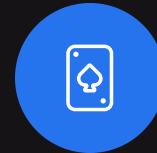
Definition

- **Chain-of-questions** is an advanced technique enabling to tackle tough questions by splitting them into smaller, more manageable ones.

- It's a learning process for AI, where it gets the hang of handling layered questions step by step.

How Chain-of-Questions Works

Employs a blend of strategies - Hard-EM and MAPO - for learning from both successful resolutions and past errors.

Outperforms older methods, significantly enhancing AI's proficiency in solving challenging questions.
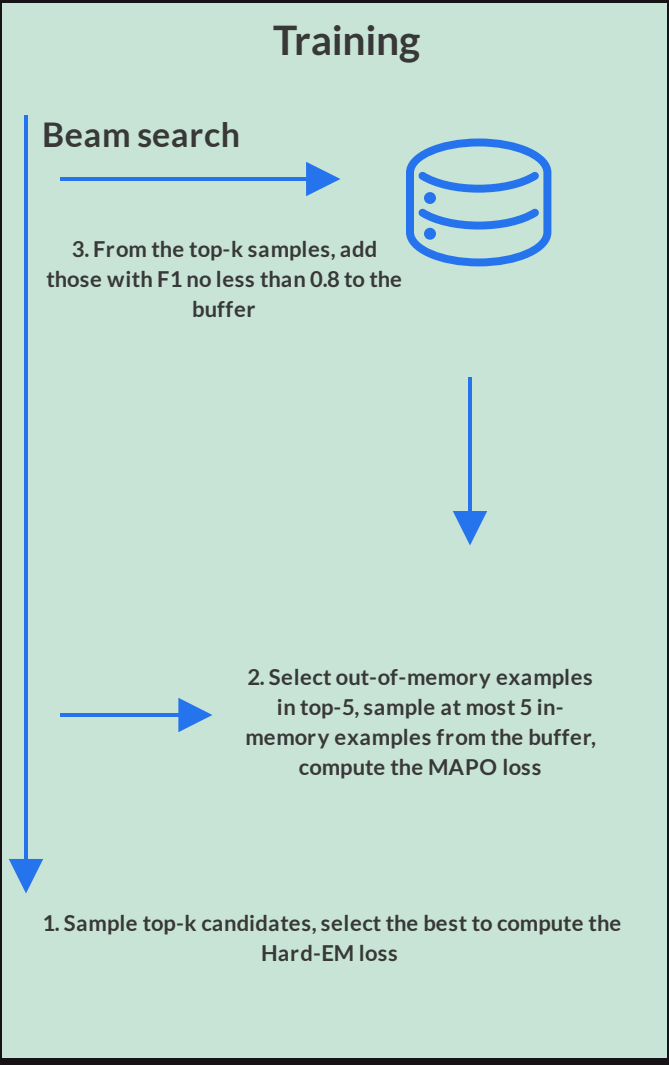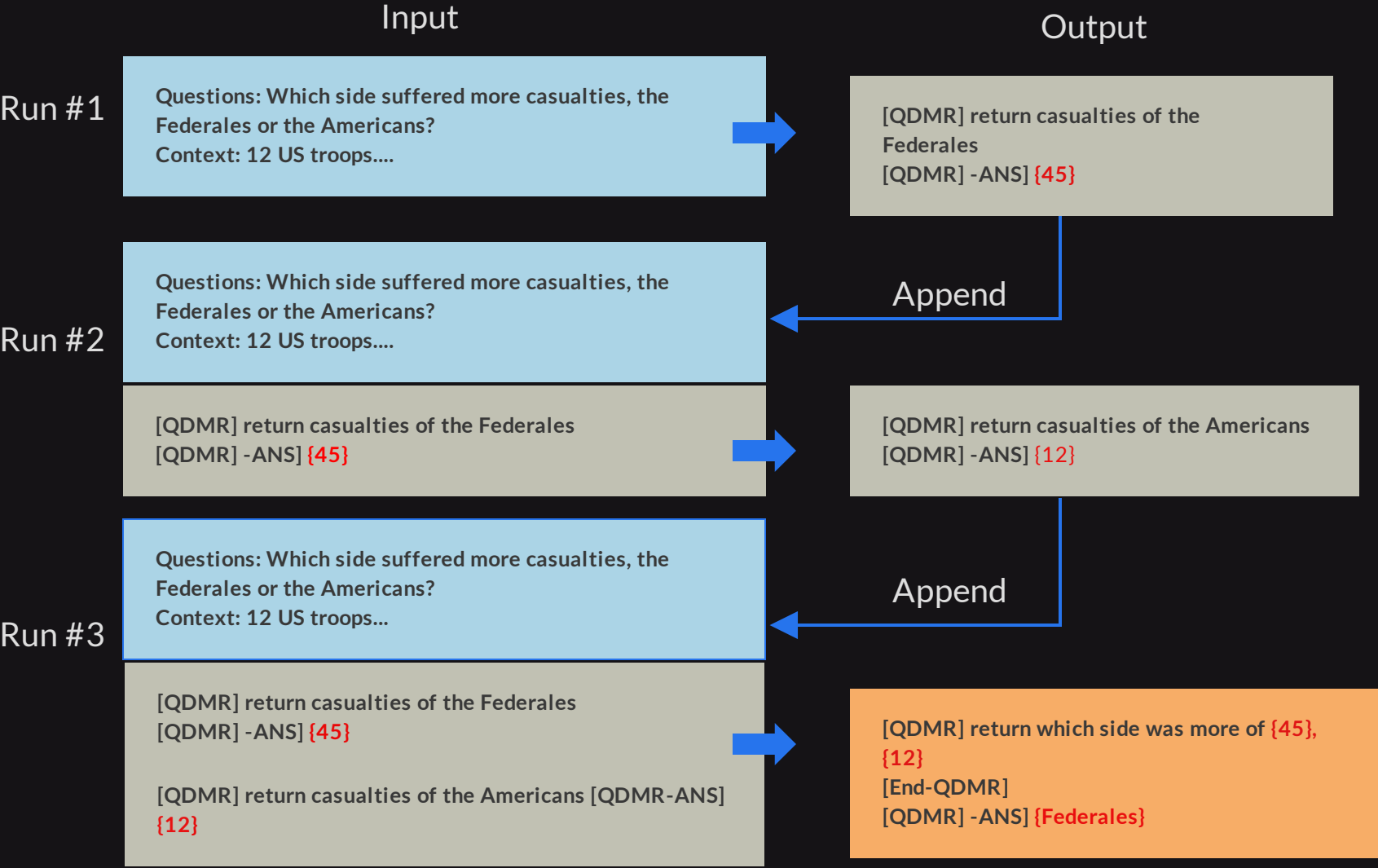
The AI increasingly leans on successful past answers via the MAPO strategy to boost the future accuracy.
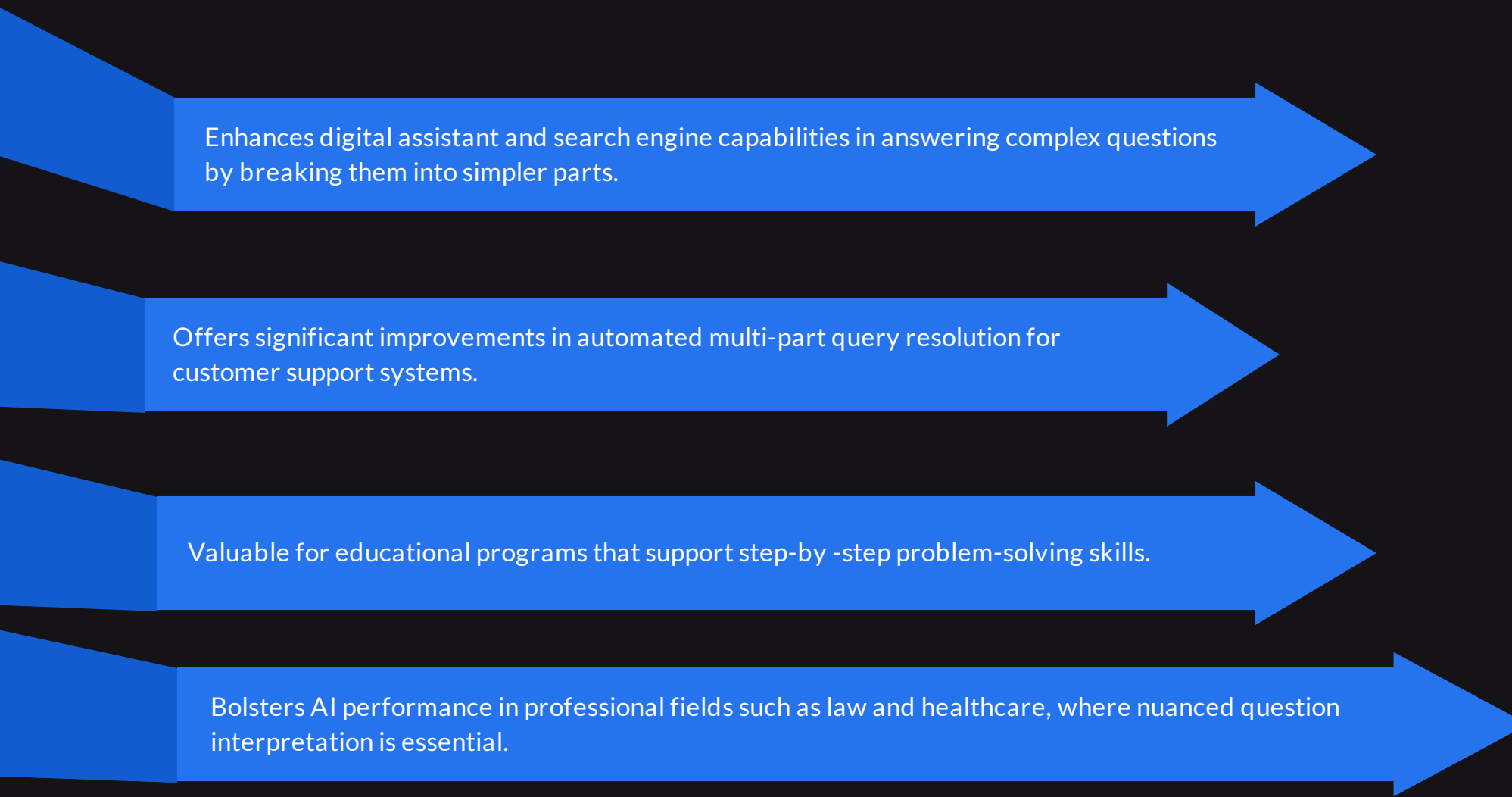
Efficient for challenging datasets, showcasing the robustness of question-answering models.

Chain-of-Questions: Example

Input

Output

Training

Run #1

Questions: Which side suffered more casualties, the Federales or the Americans?
Context: 12 US troops....

[QDMR] return casualties of the Federales
[QDMR] -ANS] {45}

Run #2

Append

Questions: Which side suffered more casualties, the Federales or the Americans?
Context: 12 US troops....

[QDMR] return casualties of the Federales
[QDMR] -ANS] {45}

[QDMR] return casualties of the Americans
[QDMR] -ANS] {12}

Run #3

Append

Questions: Which side suffered more casualties, the Federales or the Americans?
Context: 12 US troops...

[QDMR] return casualties of the Federales
[QDMR] -ANS] {45}

[QDMR] return casualties of the Americans [QDMR-ANS]
{12}

[QDMR] return which side was more of {45}, {12}
[End-QDMR]
[QDMR] -ANS] {Federales}

Beam search

3. From the top-k samples, add those with F1 no less than 0.8 to the buffer

2. Select out-of-memory examples in top-5, sample at most 5 in-memory examples from the buffer, compute the MAPO loss

1. Sample top-k candidates, select the best to compute the Hard-EM loss

Analytics Vidhya

Chain-of-Question: Practical Use-case

Enhances digital assistant and search engine capabilities in answering complex questions by breaking them into simpler parts.

Offers significant improvements in automated multi-part query resolution for customer support systems.

Valuable for educational programs that support step-by -step problem-solving skills.

Bolsters AI performance in professional fields such as law and healthcare, where nuanced question interpretation is essential.

Analytics Vidhya

Thank You

Analytics Vidhya