

# Knowledge Grounding in Retrieval-Augmented LMs Quick Update

Martin Fixman et. al

City, University of London

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## New questions

More questions were added, including:

What was the duration of {historical\_event}?

What are the dimensions of {painting}?

What is the melting point of {element}?

What's the main nationality of {person}?

# New Questions

Category	Questions			Objects			Total
book	5	+		45	=		225
city	7	+		60	=		420
element	5	+		35	=		175
historical_event	3	+		56	=		168
painting	7	+		39	=		273
person	7	+		47	=		329
principle	5	+		30	=		150
Total	39			312			2040

## Better calculation of probabilities

Now we properly use<sup>1</sup> perplexity rather than average-of-token-probabilities.

$$\text{CE} = -\frac{1}{N} \sum \log P(x_i)$$
$$\text{Perplexity} = e^{\text{CE}}$$

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<sup>1</sup>Due to a last-minute problem with precision on some large answers, today's plots will still have average-of-token-probabilities. Sorry!

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## Different flavour of Llama

Part of the hypothesis<sup>2</sup>.

Will a larger model tend to prefer parametric answers?

I'm not using two models of Llama:

`meta-llama/Meta-Llama-3.1-8B-Instruct`

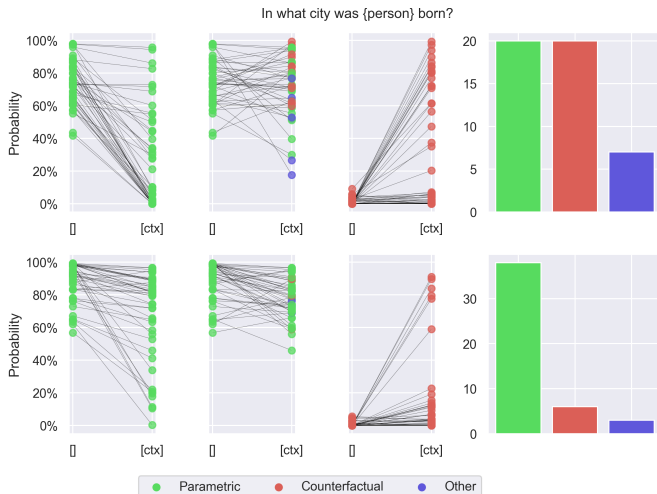
`meta-llama/Meta-Llama-3.1-70B-Instruct`

More models will come soon!

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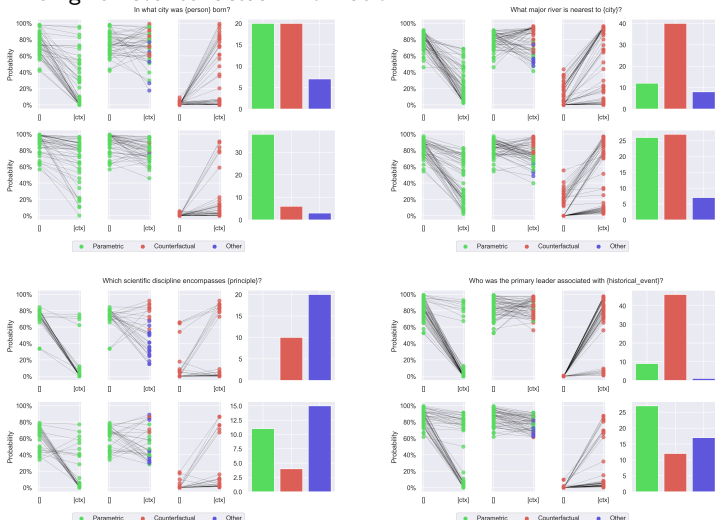
<sup>2</sup>The full hypothesis will come later.

Calculating probabilities for both parametric and counterfactual answer, regardless of which one gets answered.



# Some interesting results

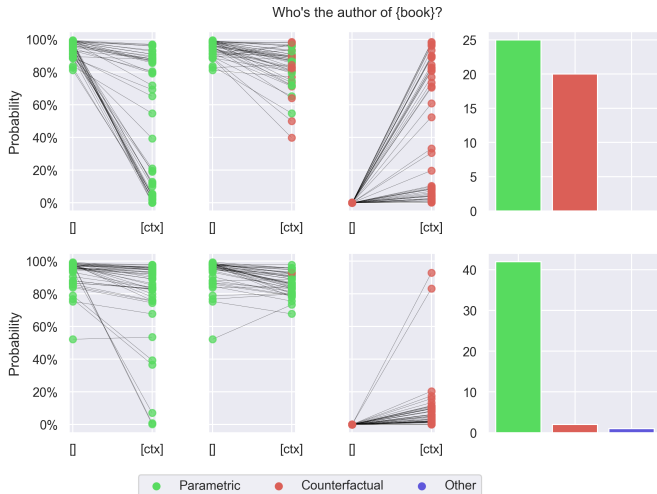
Larger models tend to have a higher chance of choosing a parametric answer when given counterfactual information.





## Some interesting results

Certain counterfactual answers have low probability, even when being added as part of the context.



## Next Steps

Very important: **Define a hypothesis!**  
A lot more!