Getting Started with Llama3

Lucas Soares

12-03-2025

Methodology Notes

Methodology Notes

1. Presentation Block

Methodology Notes

1. Presentation Block
2. Notebook Demo

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2. Notebook Demo
3. Quick Q&A + Summary

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4. Optional Exercise During Q&A

Methodology Notes

1. Presentation Block
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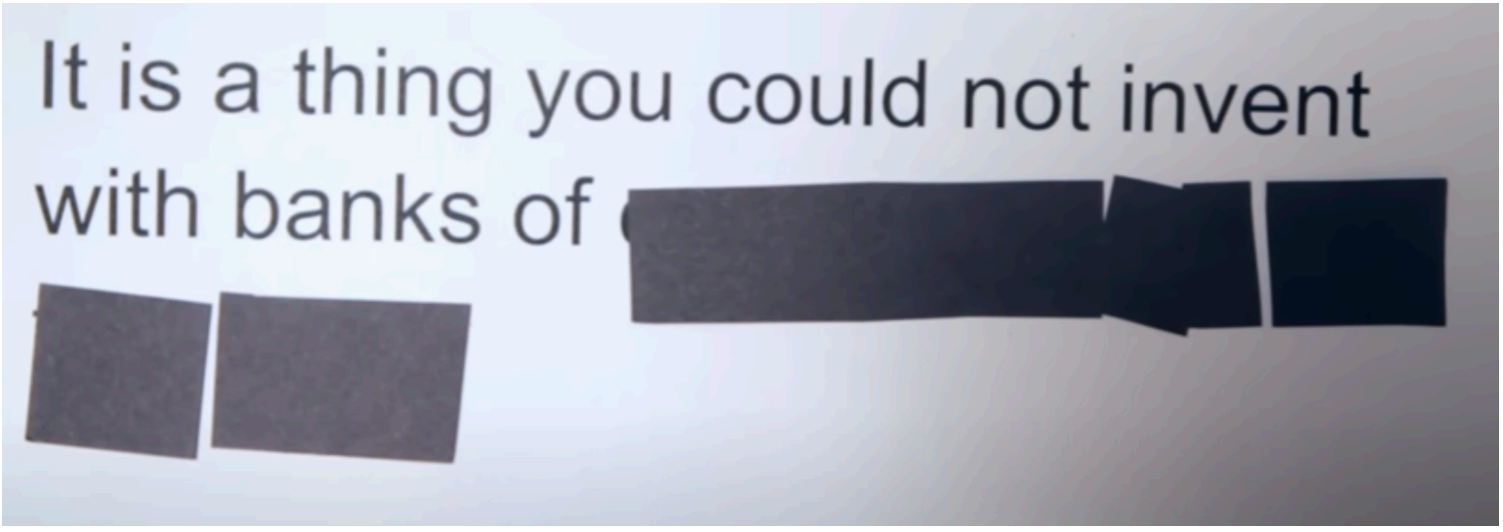
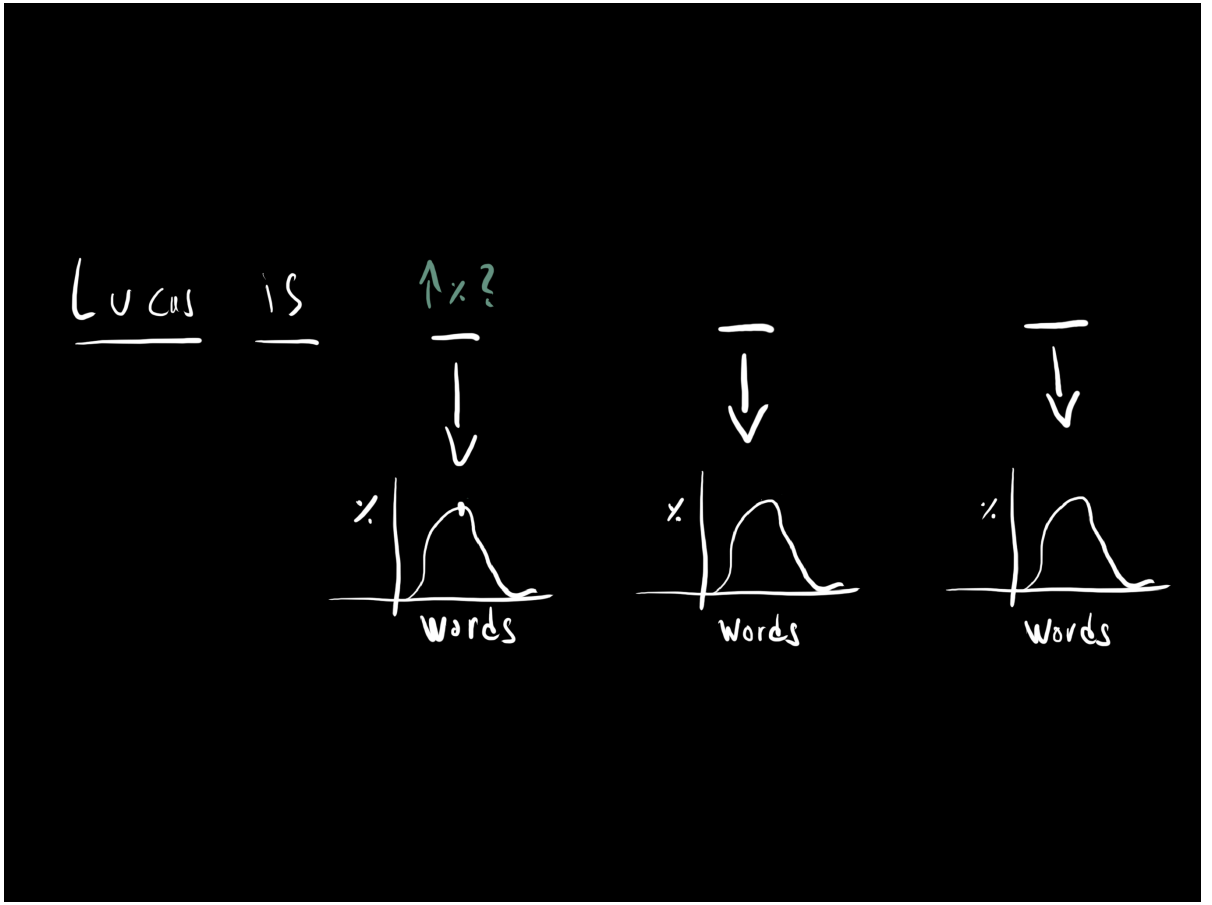
3. Quick Q&A + Summary
4. Optional Exercise During Q&A
5. Repeat

LLMs Predict the Next Word



LLMs Predict the Next Word



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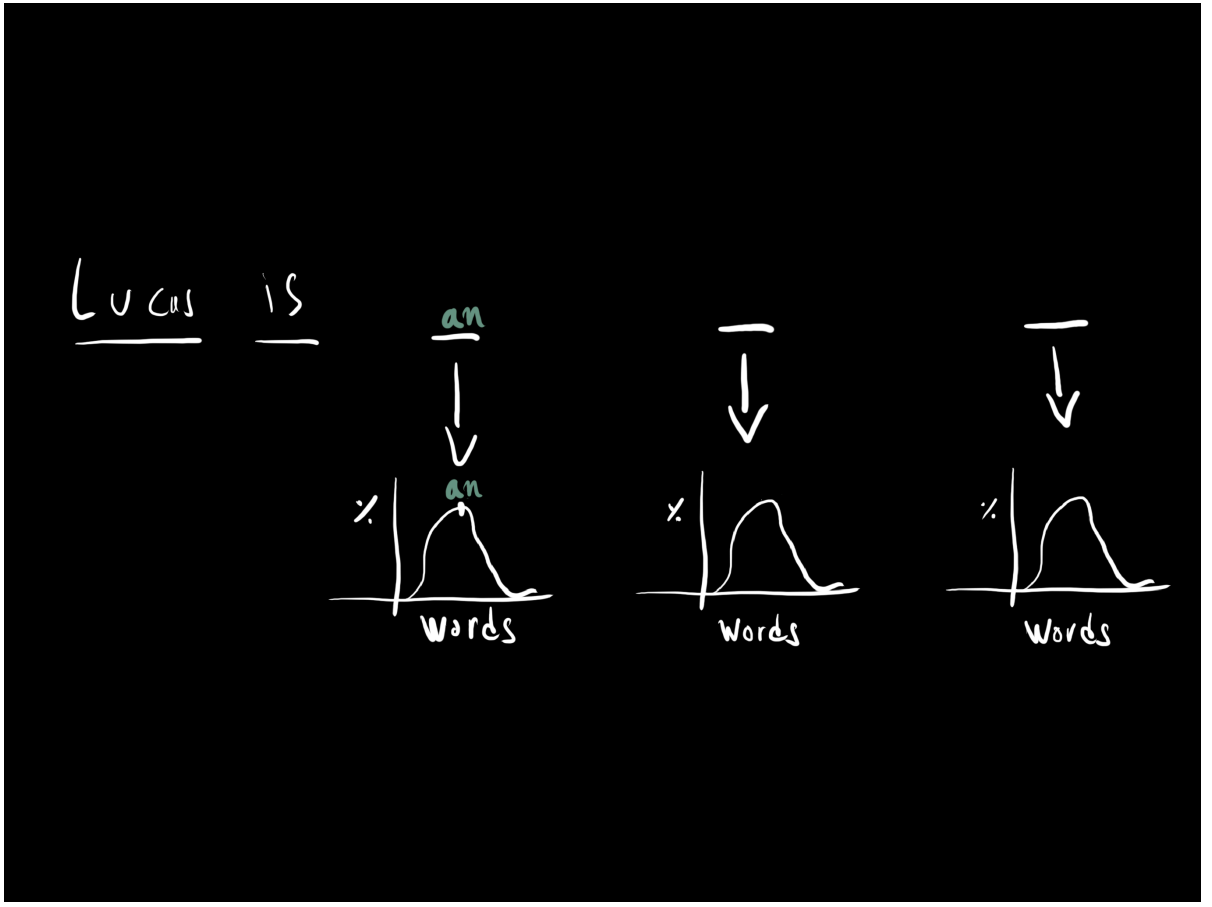

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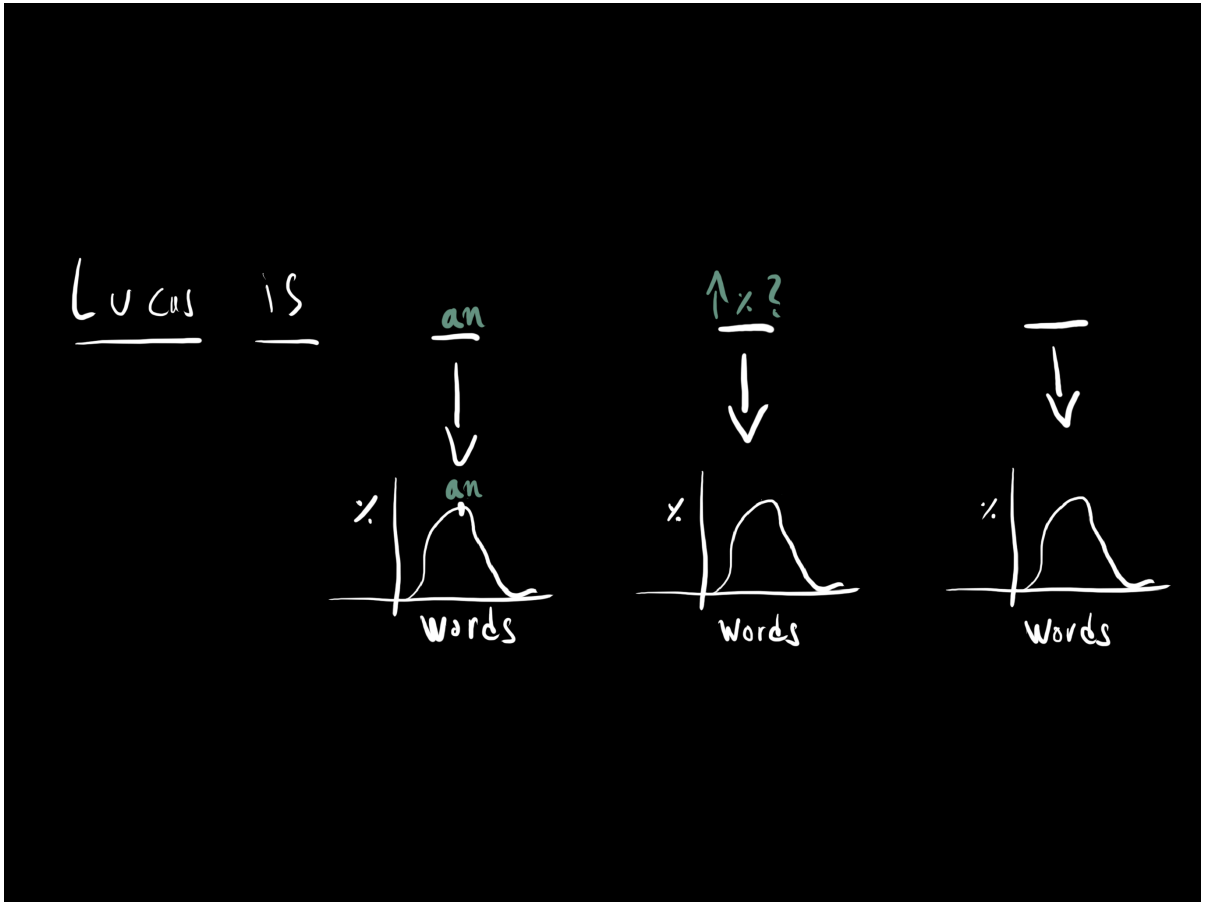

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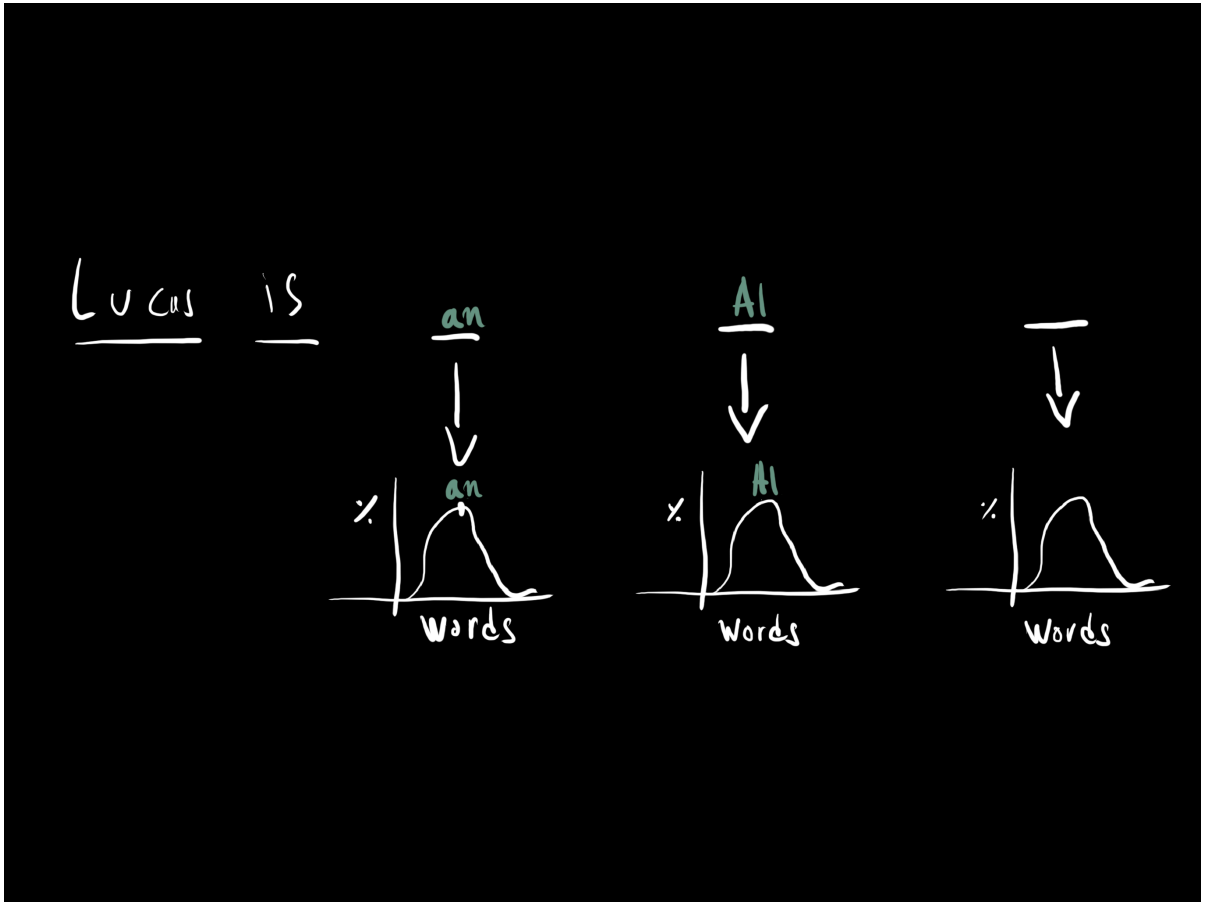

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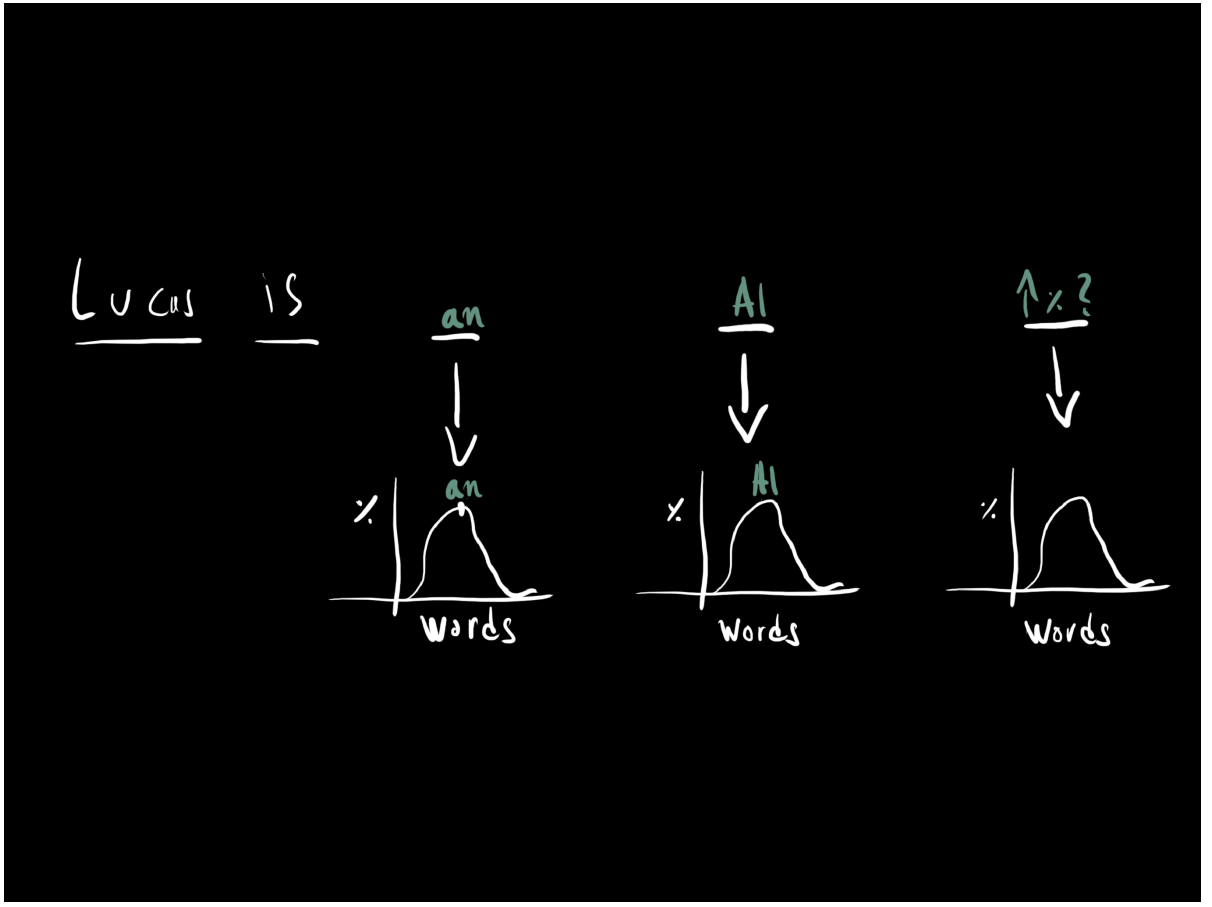
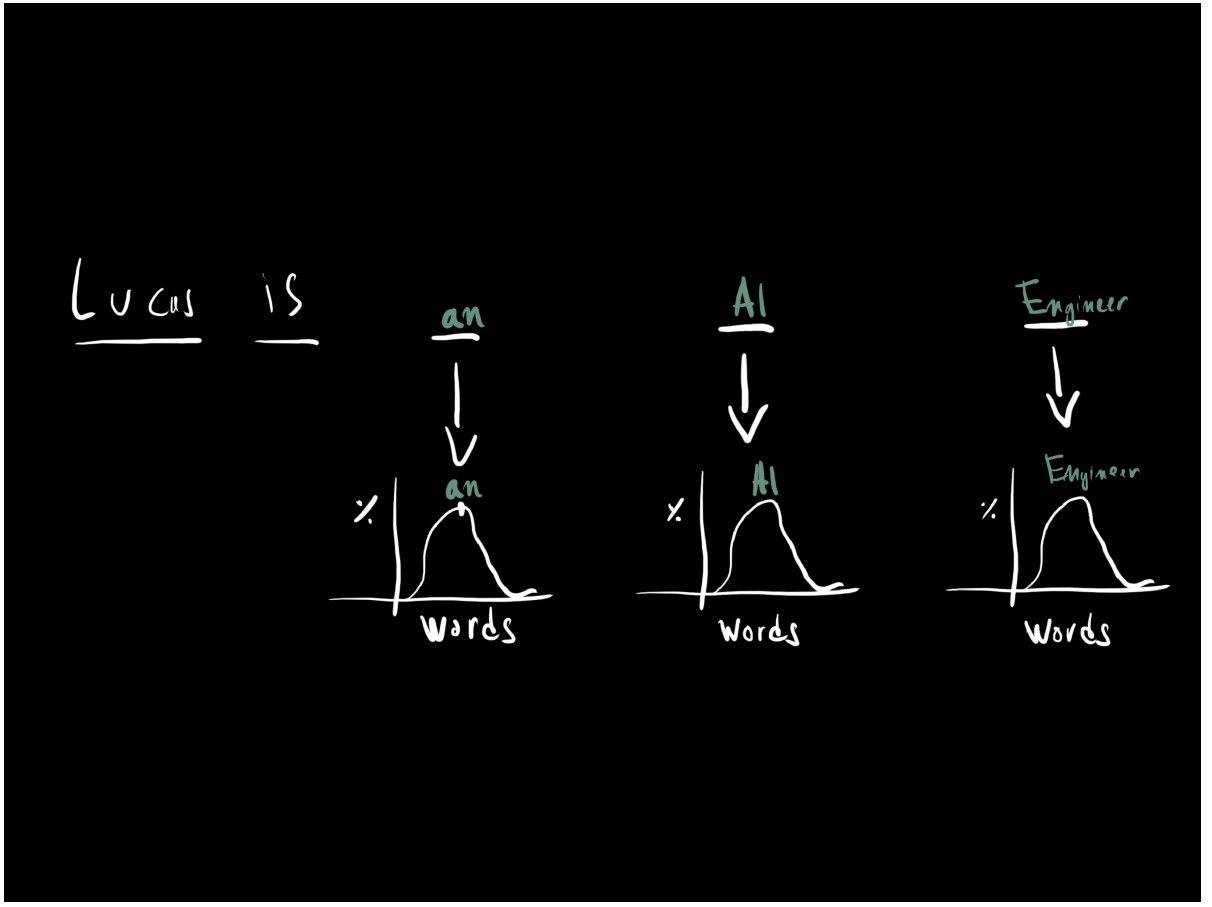
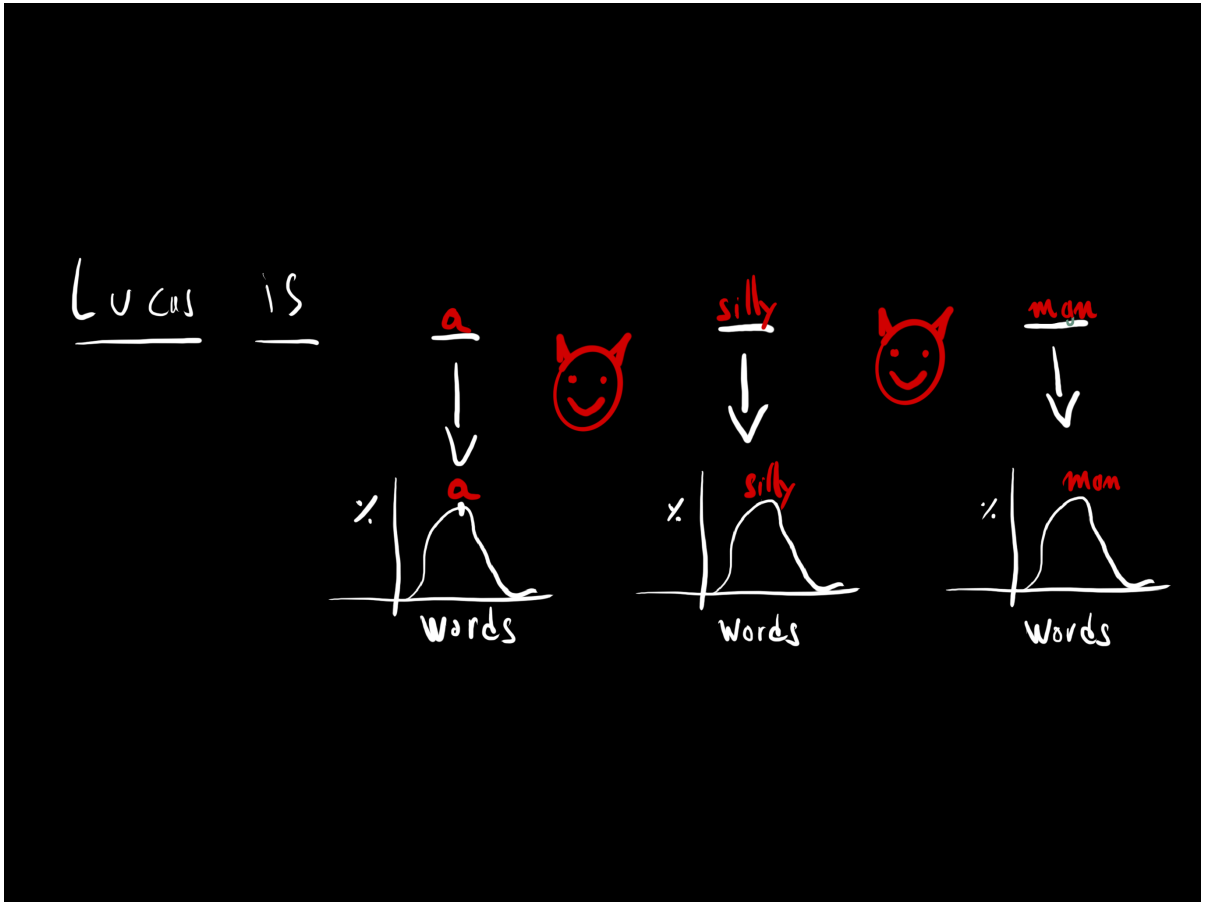
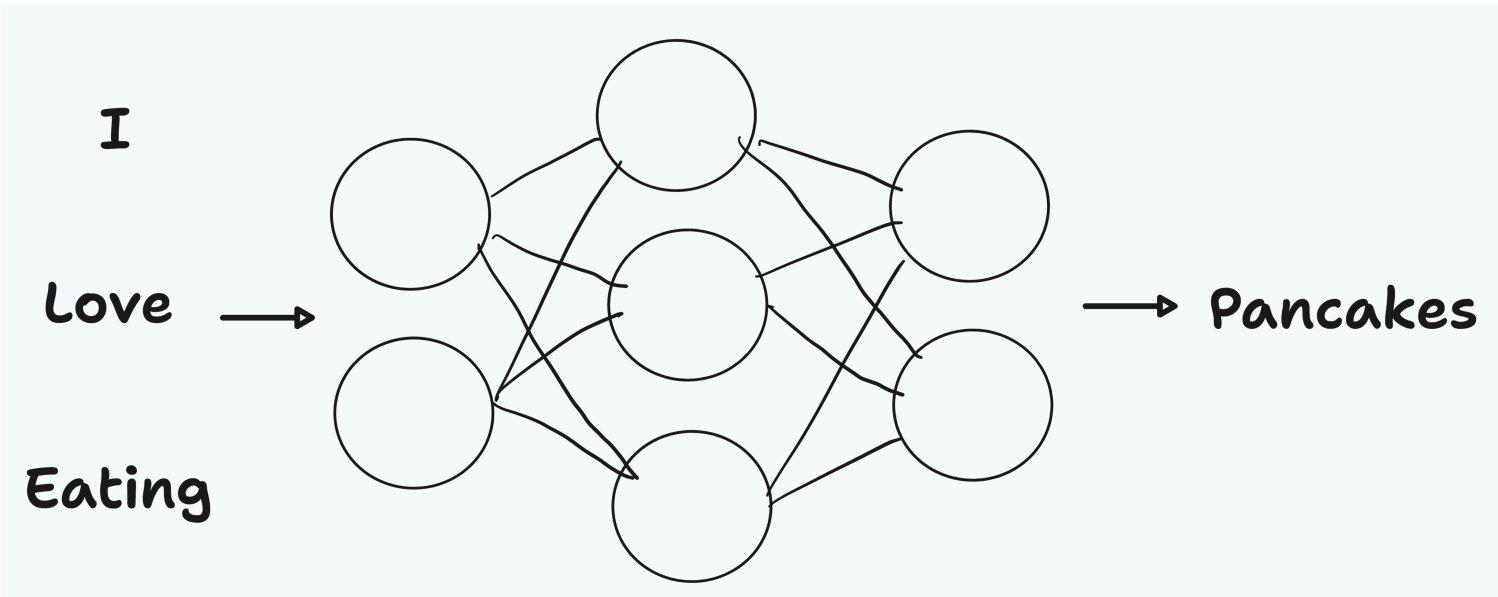


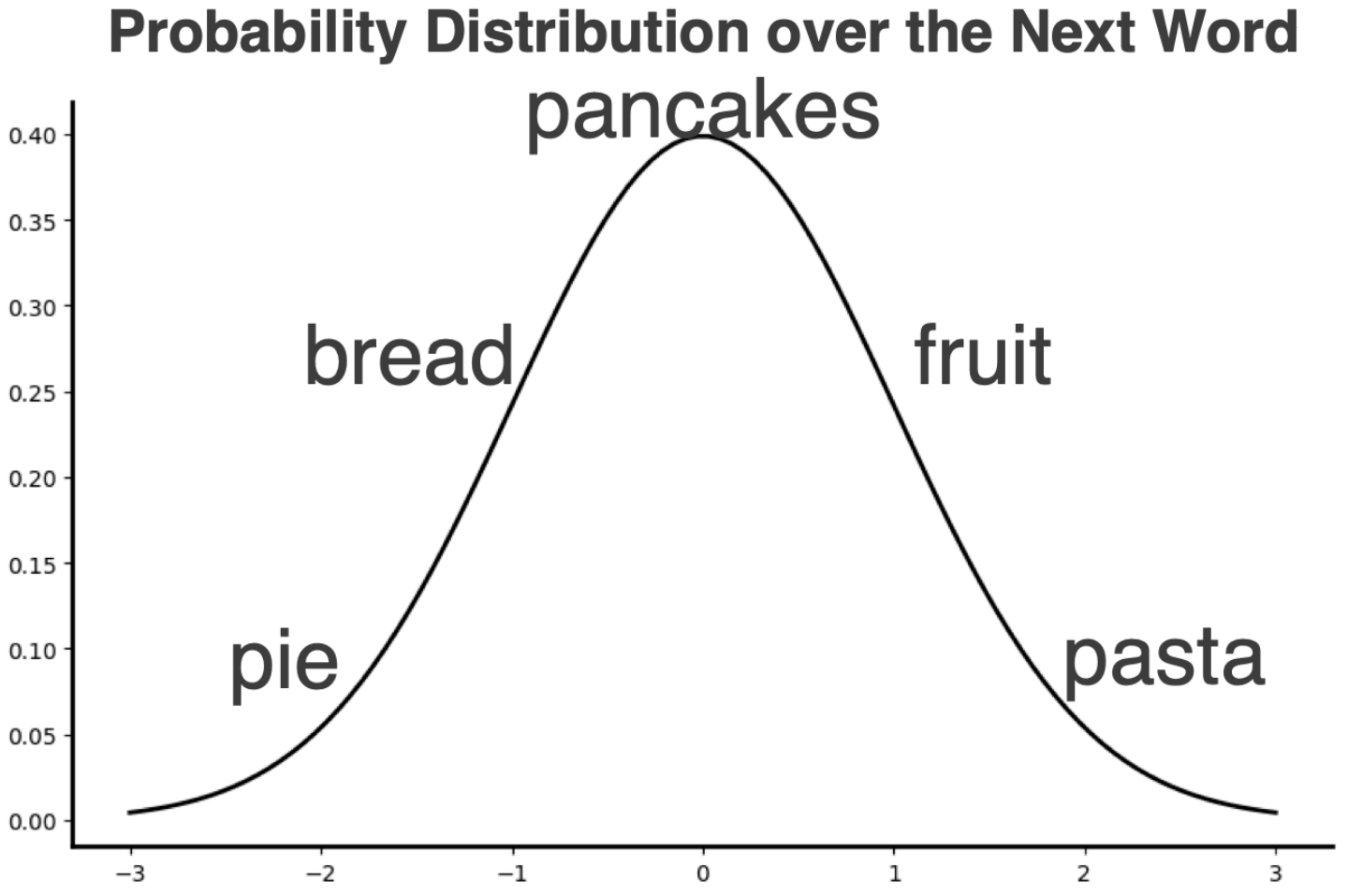
LLMs Predict the Next Word



LLMs Predict the Next Word




I
Love
Eating
Pancakes


Probability Distribution over the Next Word
pancakes
bread
fruit
pie
pasta
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
−3
−2
−1
0
1
2
3

Introduction to Llama 3

The future of AI: Built with Llama

December 19, 2024 • 8 minute read

Llama3 Releases

- Meta Released Llama 3 in April of 2024
- Llama 3.1 was released in July of 2024
- Llama 3.2 was released in September of 2024
- Llama 3.3 was released in December of 2024

Llama 3 Series

- Open source with a Commercial license

Llama 3 Series

- Open source with a Commercial license
- The latest and greatest: Llama3.3

	Training Data	Params	Input modalities	Output modalities	Context length	GQA	Token count	Knowledge cutoff
Llama 3.3 (text only)	A new mix of publicly available online data.	70B	Multilingual Text	Multilingual Text and code	128k	Yes	15T+	December 2023

Hugging Face - Llama 3.3 70B Instruct

Llama 3.3 Evaluation Results

Category	Benchmark	# Shots	Metric	Llama 3.1 8B Instruct	Llama 3.1 70B Instruct	Llama-3.3 70B Instruct
	MMLU (CoT)	0	macro_avg/acc	73.0	86.0	86.0
	MMLU Pro (CoT)	5	macro_avg/acc	48.3	66.4	68.9
Steerability	IFEval			80.4	87.5	92.1
Reasoning	GPQA Diamond (CoT)	0	acc	31.8	48.0	50.5
Code	HumanEval	0	pass@1	72.6	80.5	88.4
	MBPP EvalPlus (base)	0	pass@1	72.8	86.0	87.6
Math	MATH (CoT)	0	sympy_intersection_score	51.9	68.0	77.0
Tool Use	BFCL v2	0	overall_ast_summary/macro_avg/valid	65.4	77.5	77.3
Multilingual	MGSM	0	em	68.9	86.9	91.1

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good at general problem solving

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follows instructions well

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good at thinking
GPT-4o is 54%

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good at coding

Whiteboard - Llama 3 Offering Breakdown

Q&A / Break

Notebook Demo - Introduction to Using The Llama Series Models

Q&A / Break

Query Your Docs Locally with Llama 3

- Need for LLMs with access to context-relevant data.

Query Your Docs Locally with Llama 3

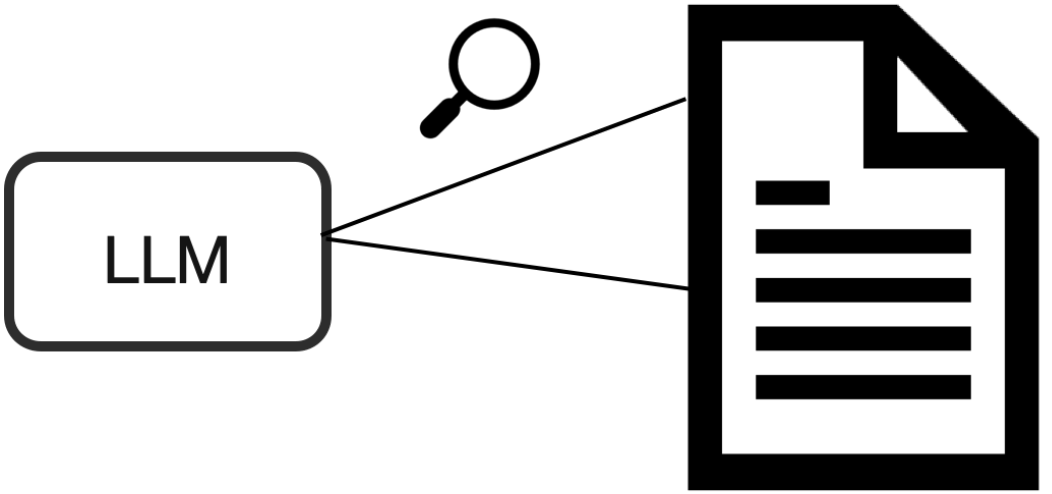
- Privacy concern with closed source LLMs.

Query Your Docs Locall with Llama 3

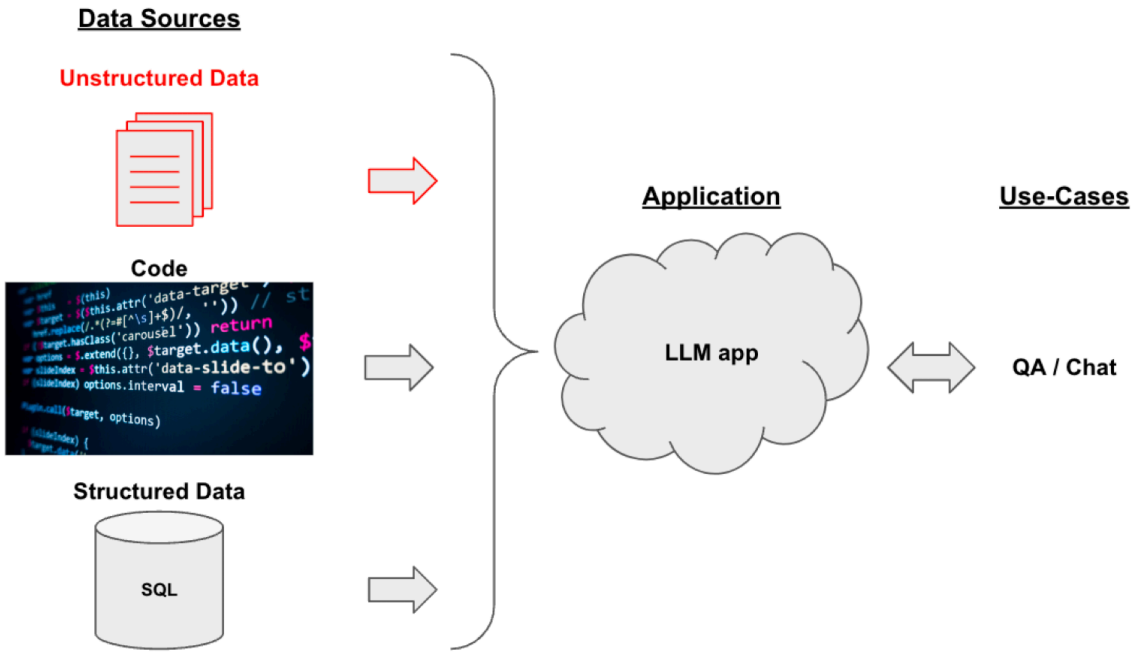
- Solution? Llama 3!

RAG with Llama 3

- RAG - Retrieval Augmented Generation



RAG with Llama 3



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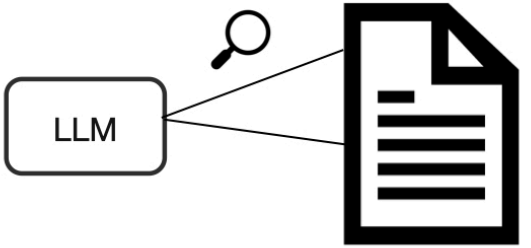
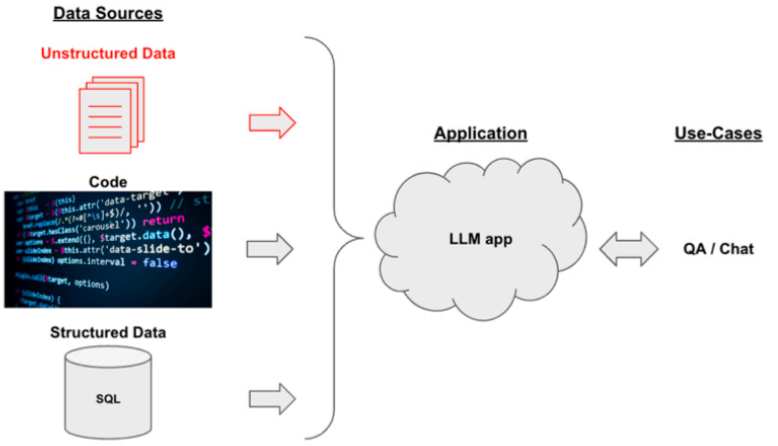


Langchain Docs

RAG - Retrieval Augmented Generation



[Langchain Docs]

- RAG - Retrieval Augmented Generation
- LLMs have a limited context length

Langchain Docs

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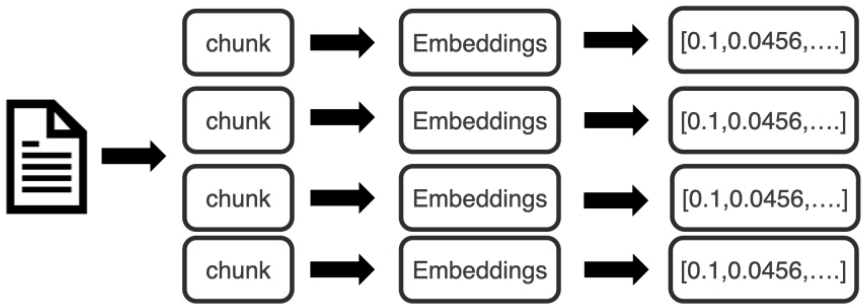
- **Embeddings**: capture content and meaning



Langchain Docs

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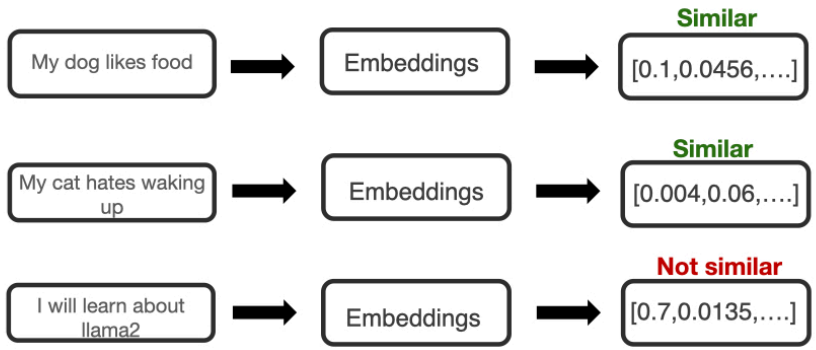

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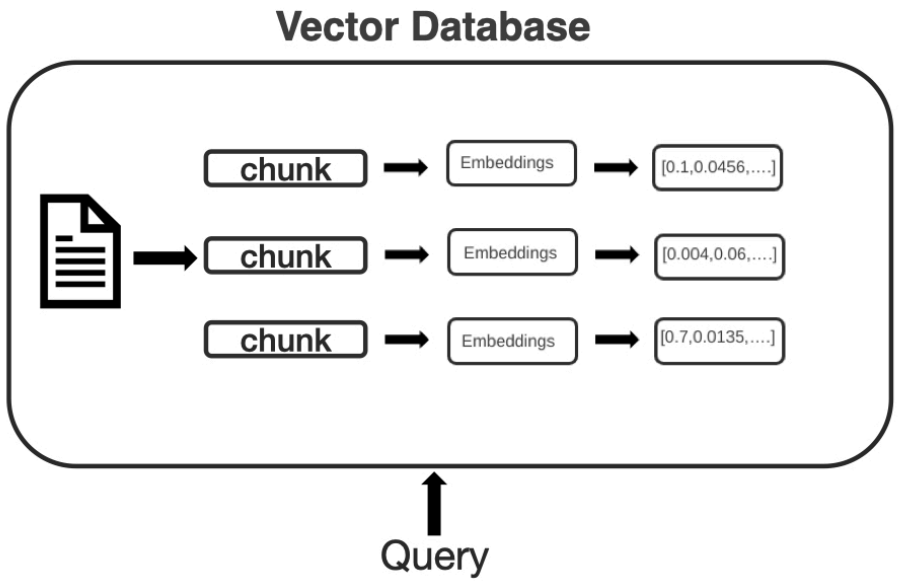

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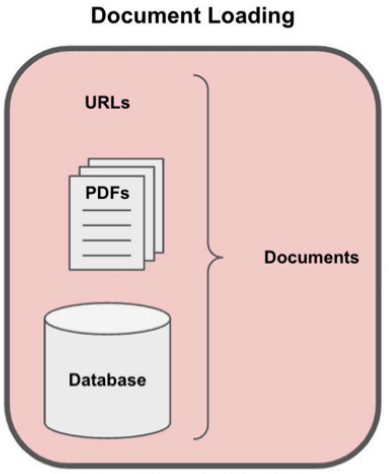
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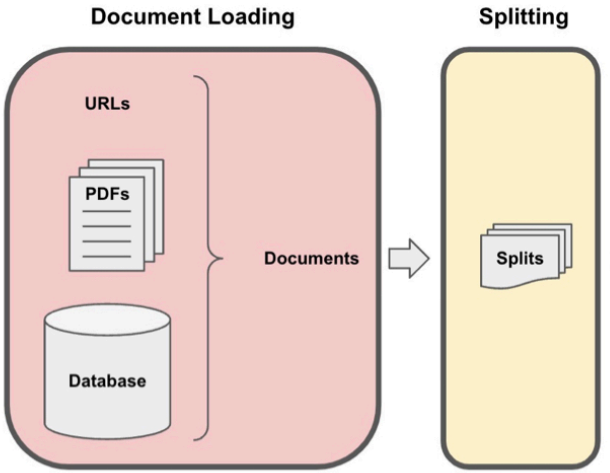
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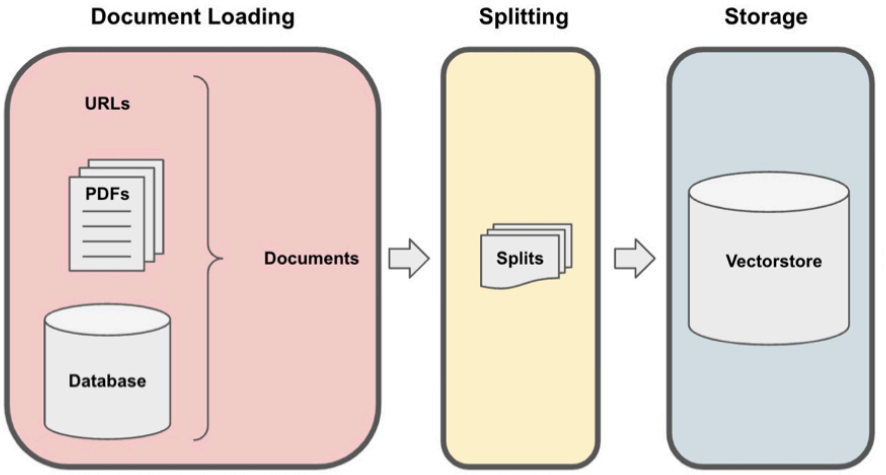
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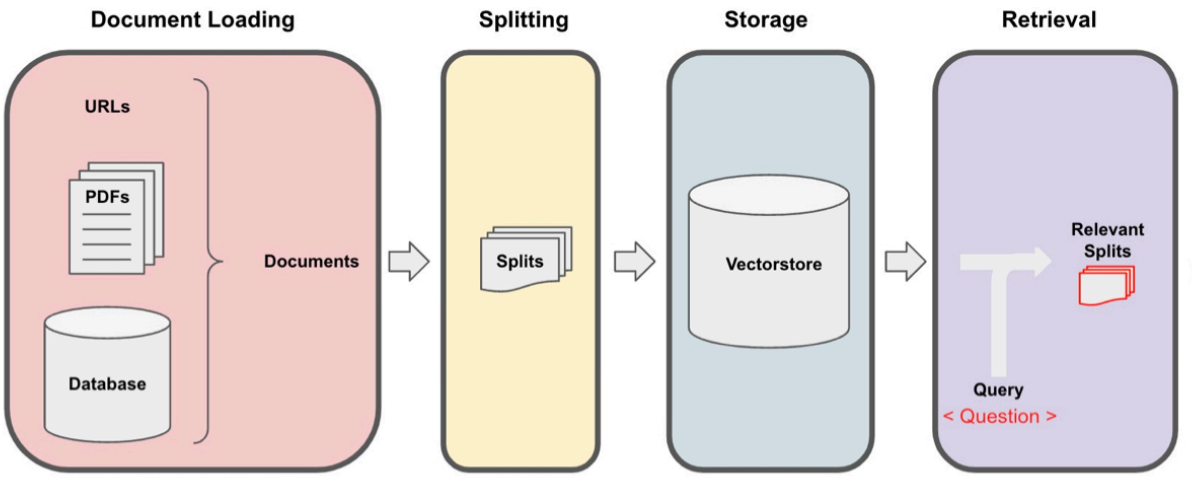
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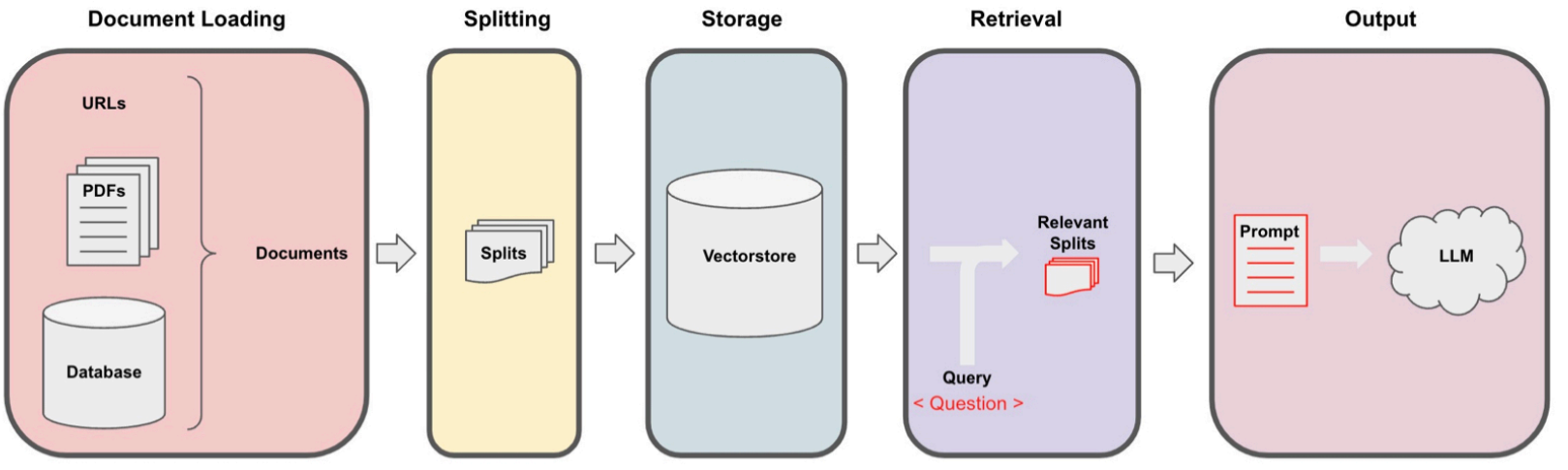
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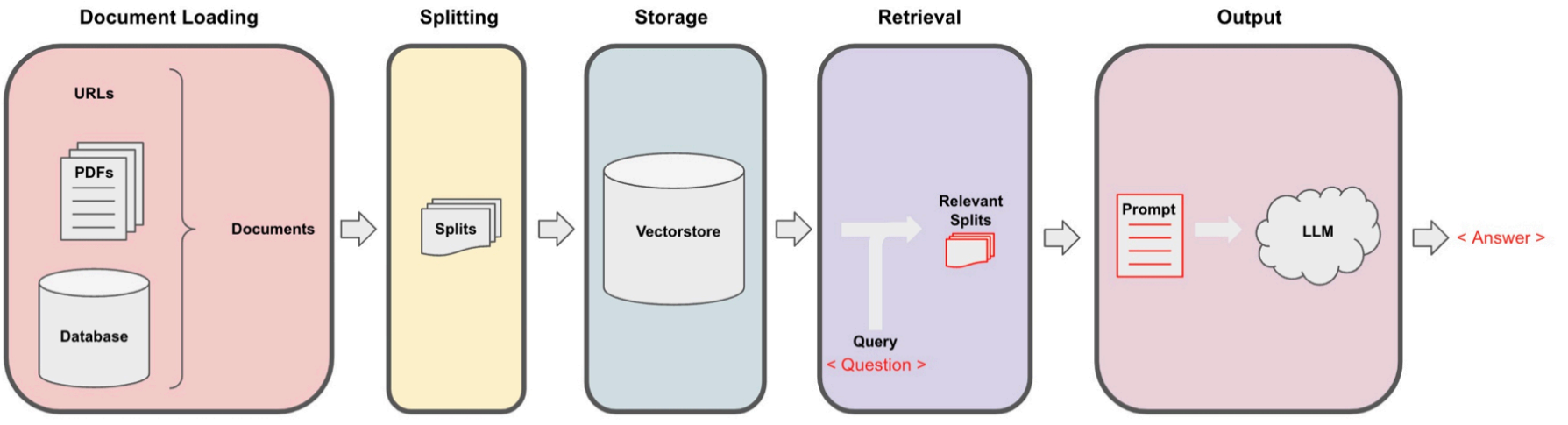
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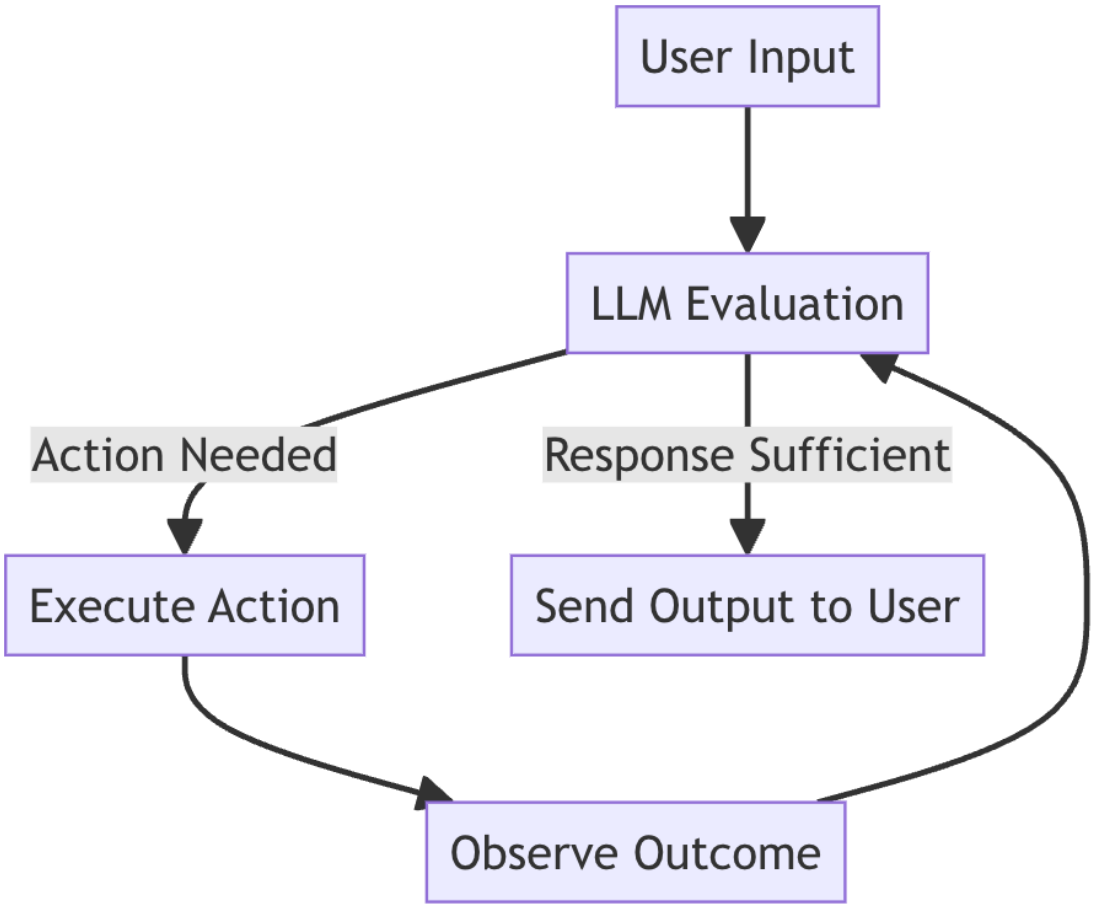
Notebook Demo - Local RAG with Llama 3

Q&A / Break

Local Agents with Llama 3

Local Agents with Llama 3



Explanation of the agent loop in cognitive architectures.

Practical Use Case: Private Docs Chatbot

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- **Scenario**: An LLM-powered chatbot designed to assist users by retrieving information from private documents.

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Practical Use Case: Private Docs Chatbot

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- **User Input**: User asks about specific details from an internal document.
- **LLM Decision**: Determines if the requested information requires search the document repository.
- **Action Taken**: If a search is required, the agent retrieves relevant document sections and provides a concise response based on the content.

Practical use case of LLM agents in customer support.

Notebook Demo - Tool Calling/Structured Outputs and local agents with Llama 3

Q&A / Break

Fine Tunning Llama 3

Whiteboard - Fine Tunning Llama 3: what, when, why and beyond

Fine Tunning Llama 3

- What is fine-tuning?

Fine Tunning Llama 3

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- It's the process of training a smaller model on a specific task leveraging a domain-specific dataset.

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- Why fine-tune?
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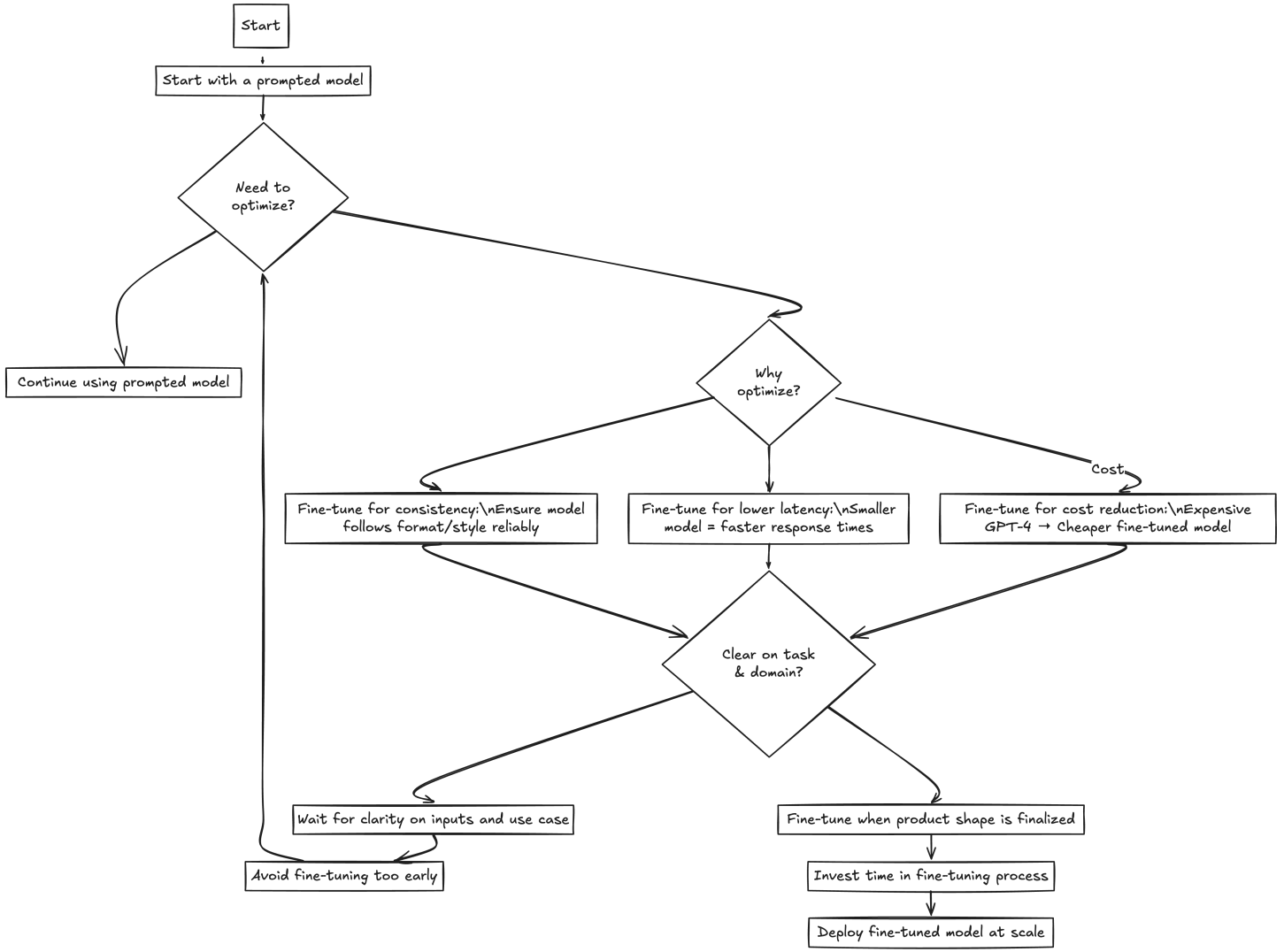
- When to fine-tune?


Start
Start with a prompted model
Need to optimize?
Continue using prompted model
Why optimize?
Cost
Fine-tune for consistency:\nEnsure model follows format/style reliably
Fine-tune for lower latency:\nSmaller model = faster response times
Fine-tune for cost reduction:\nExpensive GPT-4 → Cheaper fine-tuned model
Clear on task & domain?
Wait for clarity on inputs and use case
Avoid fine-tuning too early
Fine-tune when product shape is finalized
Invest time in fine-tuning process
Deploy fine-tuned model at scale

Notebook Demo - Fine-Tuning Llama 3 - Walkthrough

Q&A / Break

Notebook Demo - End To End Example with Llama 3

References

1. Llama 3.3 Model Card
2. Fine Tuning Video
3. High Quality Structured Report Generation Demo
4. Llama Cookbook – Finetuning
5. Llama Recipes
6. Generating Synthetic Data
7. Llama Cookbook – End-to-End Use Cases
8. Structured Outputs with Ollama
9. Chunk Size Explanation
10. Embeddings + Llama by Simon Willison
11. Embeddings + Parquet for Small Projects
12. Awesome Local LLMs
13. LLM-Driven Data Engineering
14. Text Chunking in RAG
15. Llama Resources – AI.Meta
16. Llama 3 Paper (arXiv)