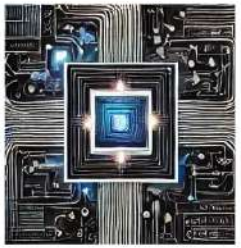
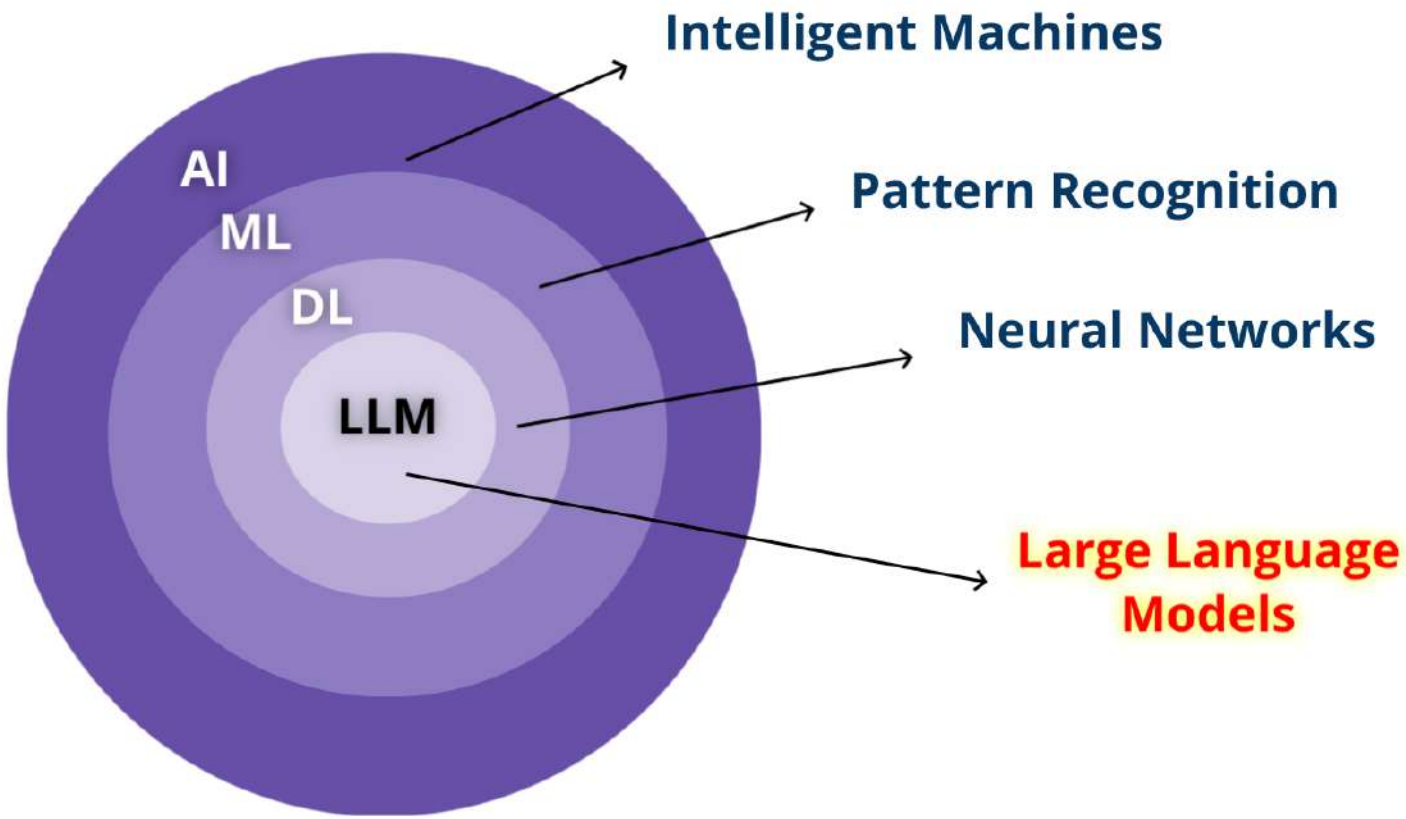
Language

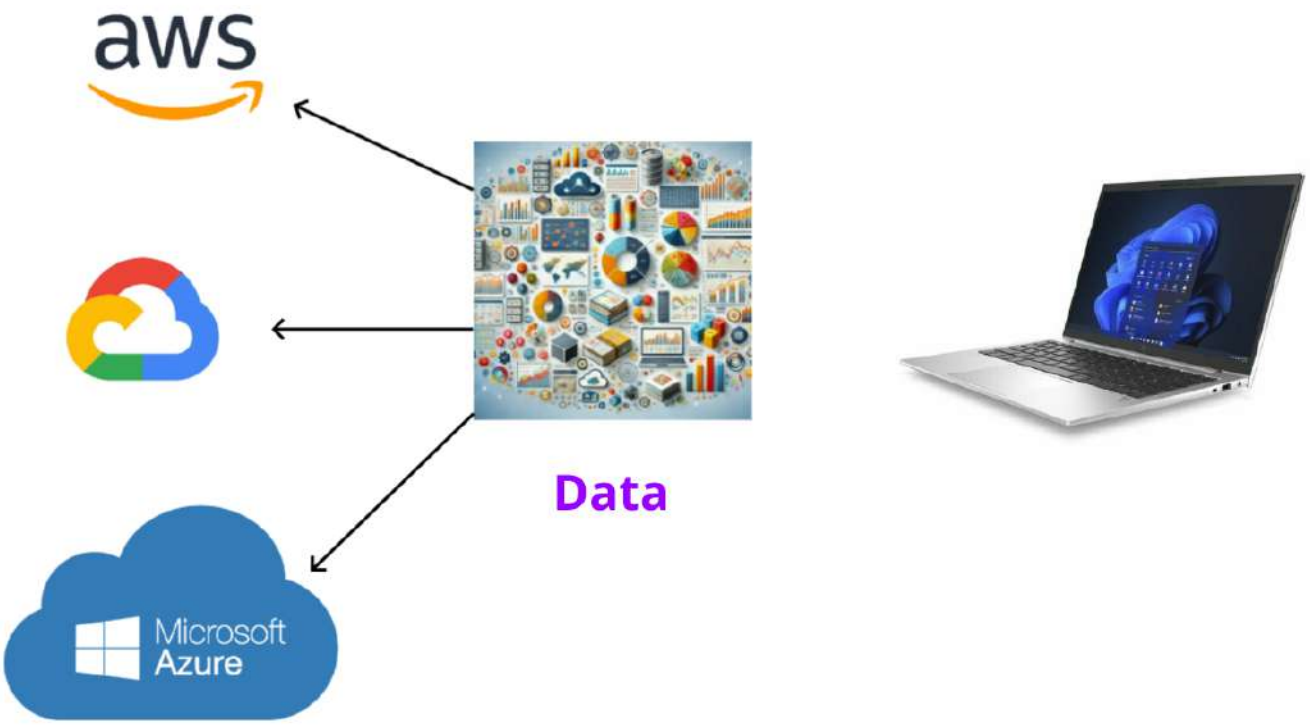



Intelligent Machines
AI
ML
DL
LLM
Pattern Recognition
Neural Networks
Large Language Models

Evolution of information storage

Stone/ Iron Age	Industrial Age	Digital Age	AI Age
			ChatGPT
Carved in stones	Written in papers	Digitalized	Cloud
Store and Retrieve	Store and Retrieve	Store and Retrieve	Store and Generate !

Cloud



Cloud Computing

You 're the owner

- Insure the vehicle
- Pay for upkeep
- Keep it secure

Taxi driver / company

- Drives the car
- Fills the tank
- Maintains it

Infrastructure

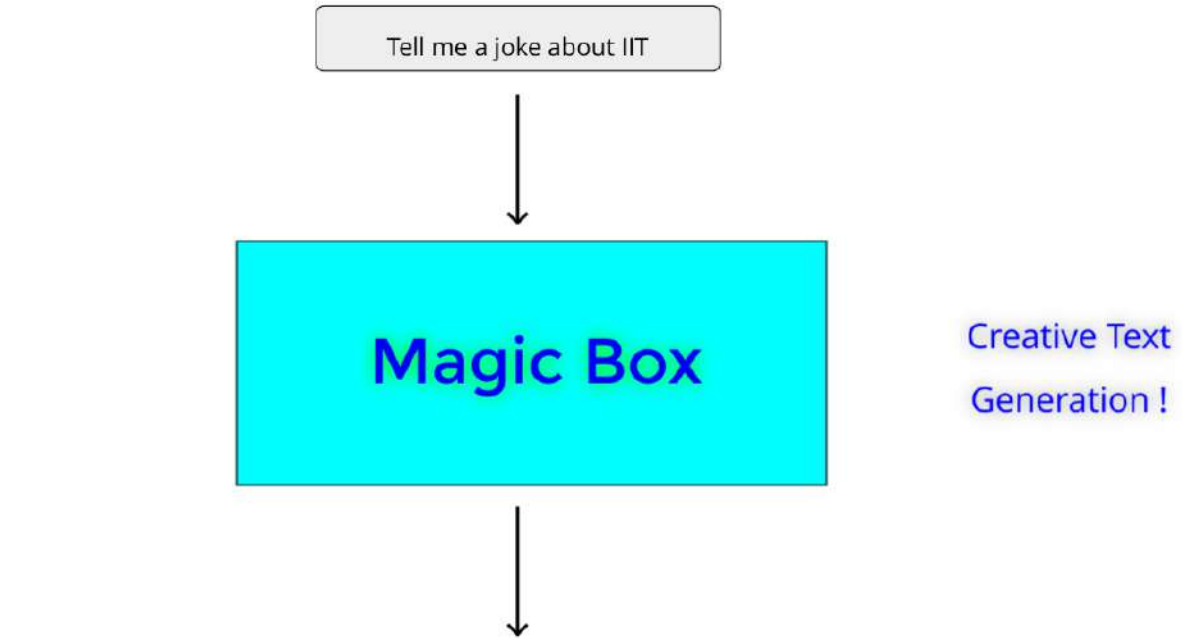
Accessibility

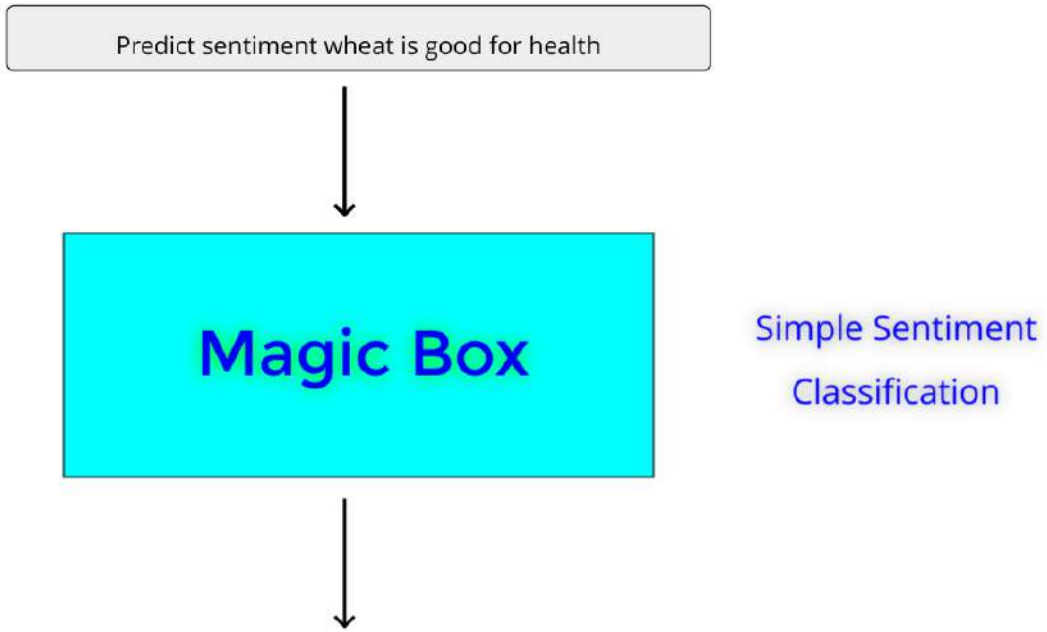
Scalability

Cost

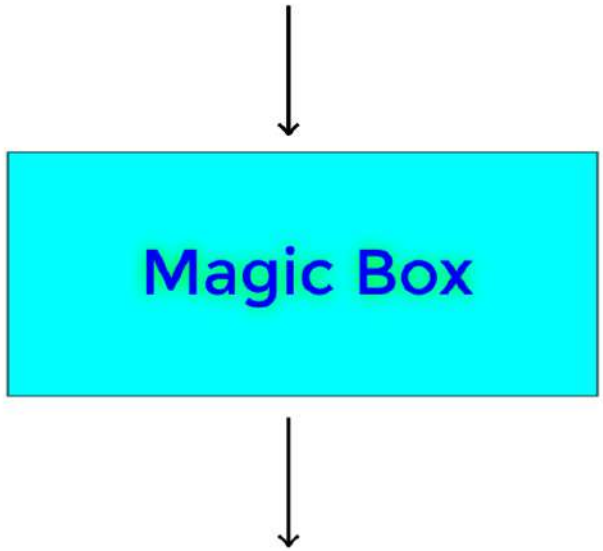
Security

Maintenance


Tell me a joke about IIT
Magic Box
Creative Text
Generation !
Why did the IIT student bring a ladder to class? Because he heard the exams were going to be
"above average"!


Predict sentiment wheat is good for health
Magic Box
Simple Sentiment
Classification
The sentiment for the phrase "wheat is good for health" is positive.

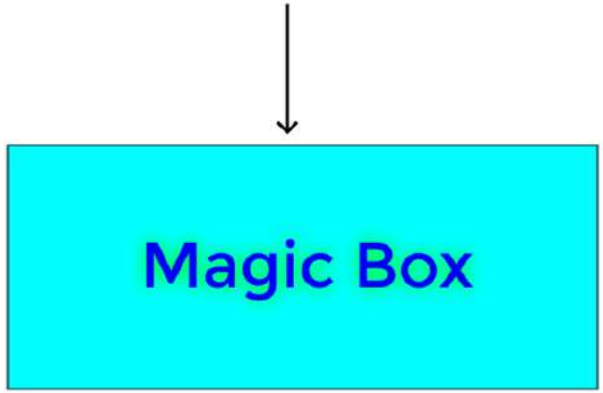
I have 3 pencils and 2 erasers. How many sharpners do I have to sharpen the pencils?



Logical Reasoning

The number of sharpeners you need to sharpen the pencils is not determined by the number of pencils and erasers you have. You would typically need just one sharpener to shave the pencils.

1 pencil costs me 6.5 Rupees and 1 eraser costs me 3.5 Rupees. If I sell the pencil for 8.75 rupees and eraser for 4.25 rupees what profit do I get for 50 pencils and 30 erasers.



Doing Arithmetic

1. Total Cost: 430 Rupees (325 Rupees for 50 pencils + 105 Rupees for 30 erasers).

2. Total Selling Price: 565 Rupees (437.5 Rupees for 50 pencils + 127.5 Rupees for 30 erasers).

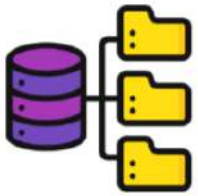
3. Profit: 135 Rupees (565 Rupees - 430 Rupees).

Who is inside Magic box ?

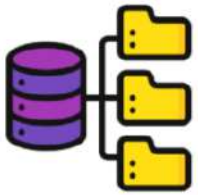
Is there any expert sitting inside it?

Is it the reason why we are getting convincing responses?

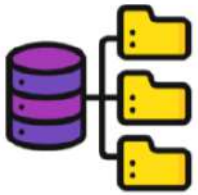
Traditional NLP Models



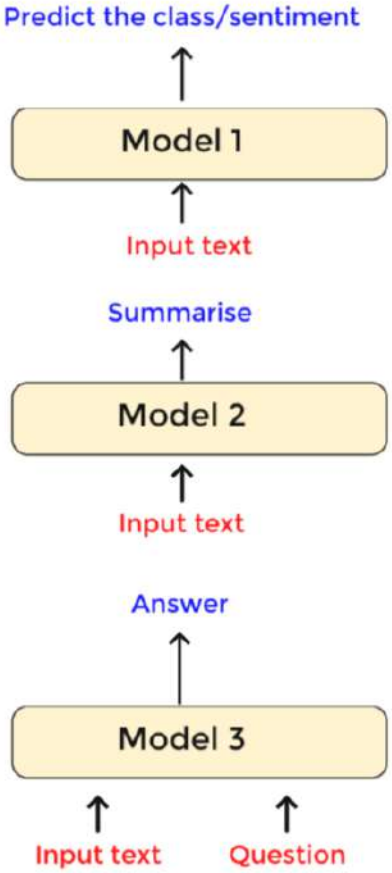
Labelled data for task 1



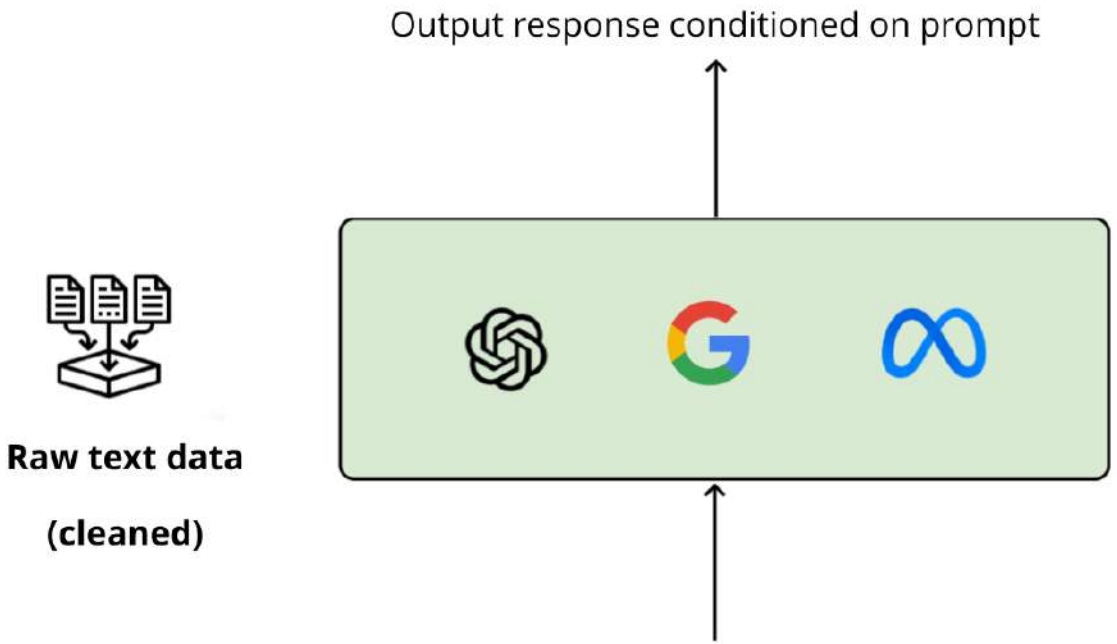
Labelled data for task 2



Labelled data for task 3

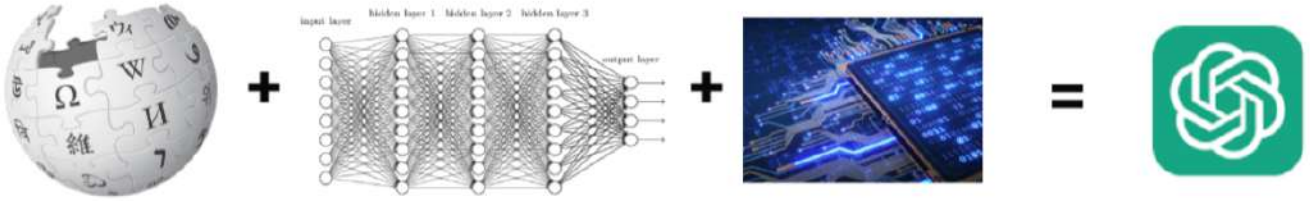


Large Language Models



Trident of LLMs

Trillions of tokens | Billions of parameters | Zeta FLOPS of Compute | LLMs



Three stages

Pre training

Fine Tuning

Inference

Pre training

The magician takes the ordinary something and makes it do something extraordinary

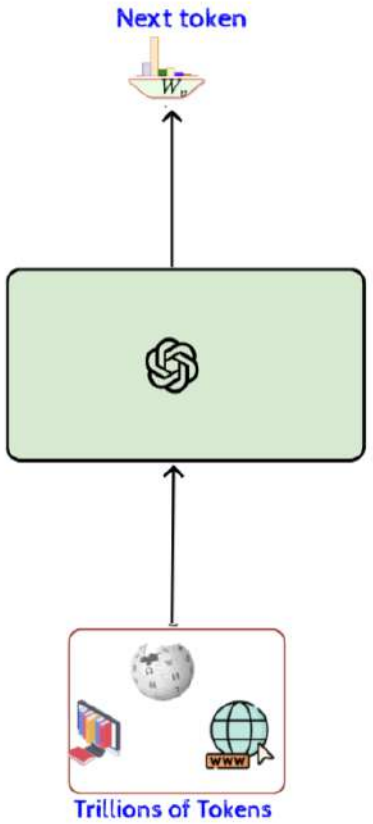
Something ordinary:

To Extraordinary

Predict next token

and next token, next token..

By doing this the model eventually learns language structure, grammar and world knowledge !



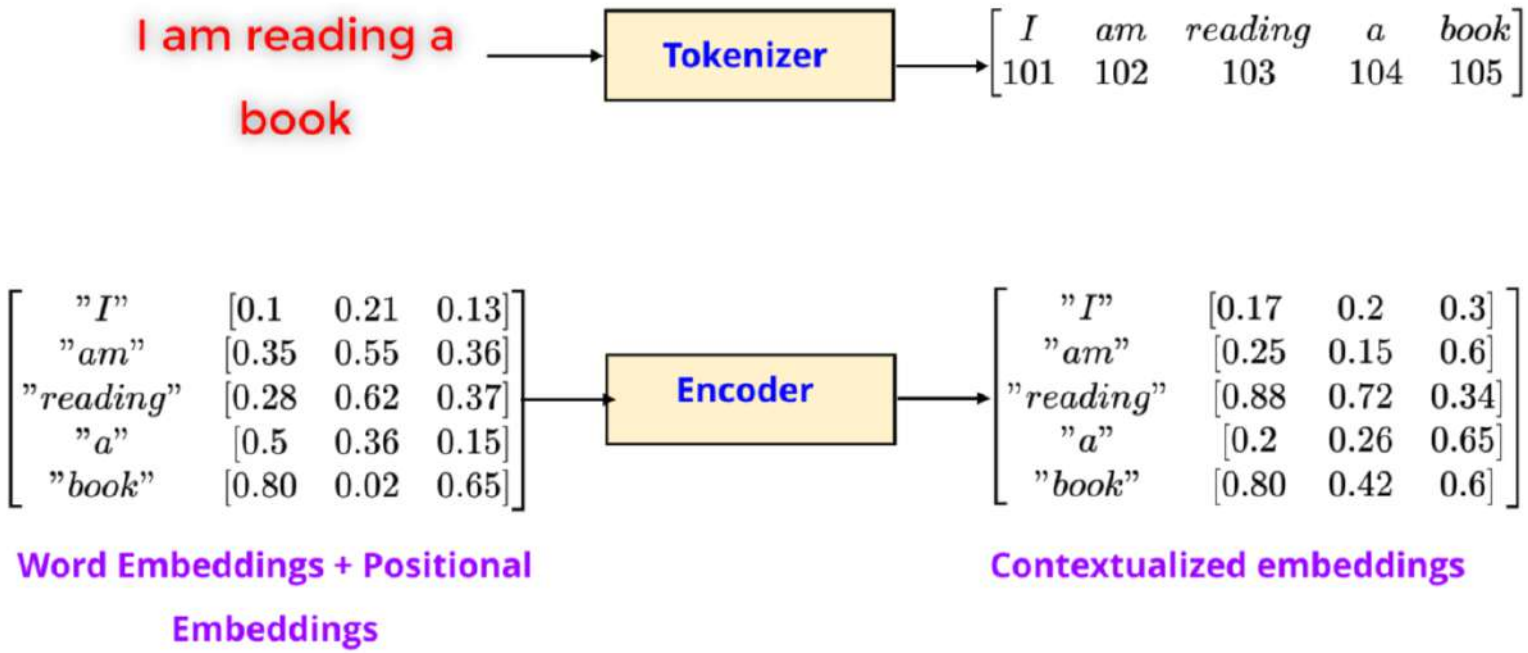
Transformers

Imagine you have a sentence in English

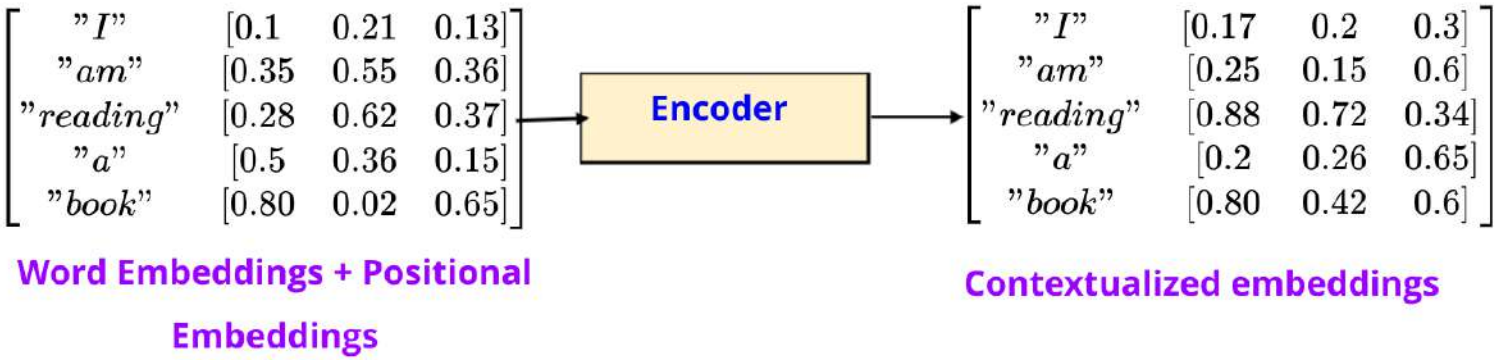
that you want to translate into Tamil

I am Reading a book ⟶ Naan oru puthagathai padiththu kondirukiren.

Transformers

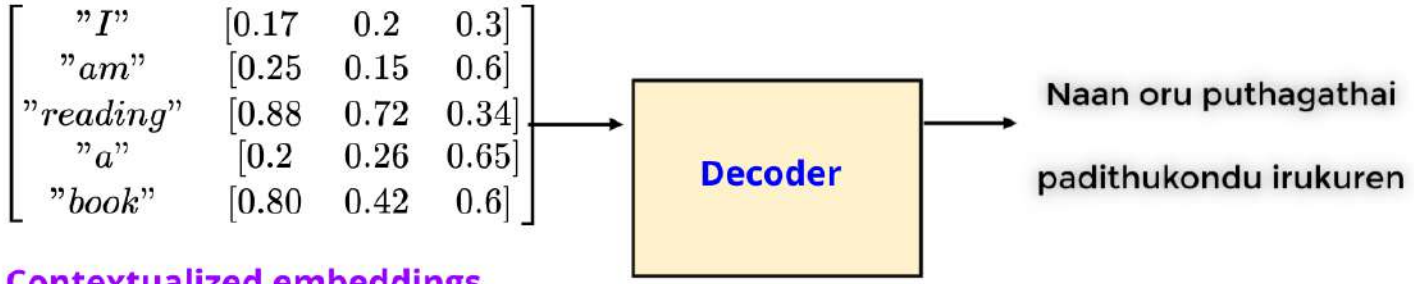


Transformers



Word Embeddings + Positional Embeddings

Contextualized embeddings



Contextualized embeddings

Thank You !