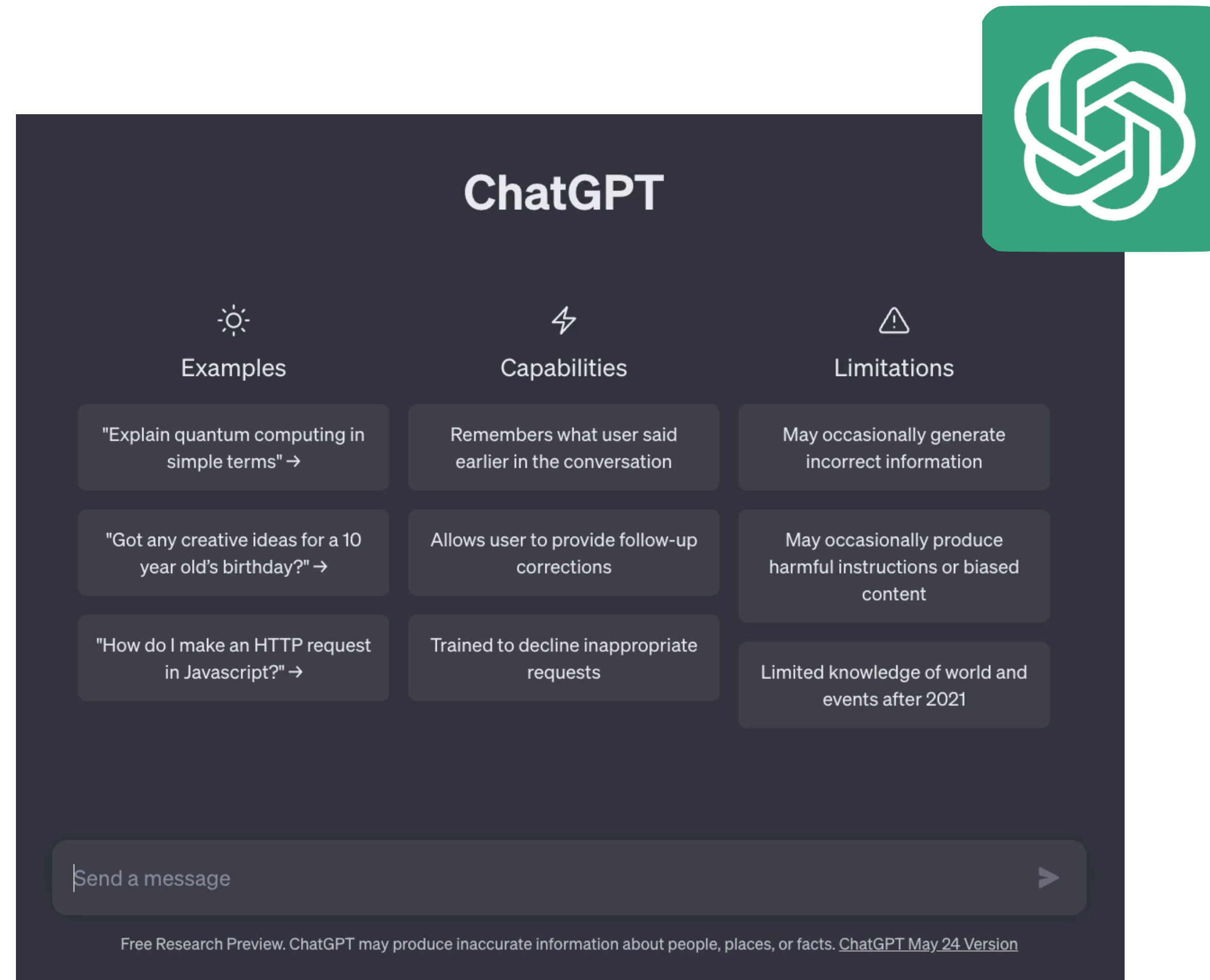


# A Practical Introduction to LLMs

Shawhin Talebi

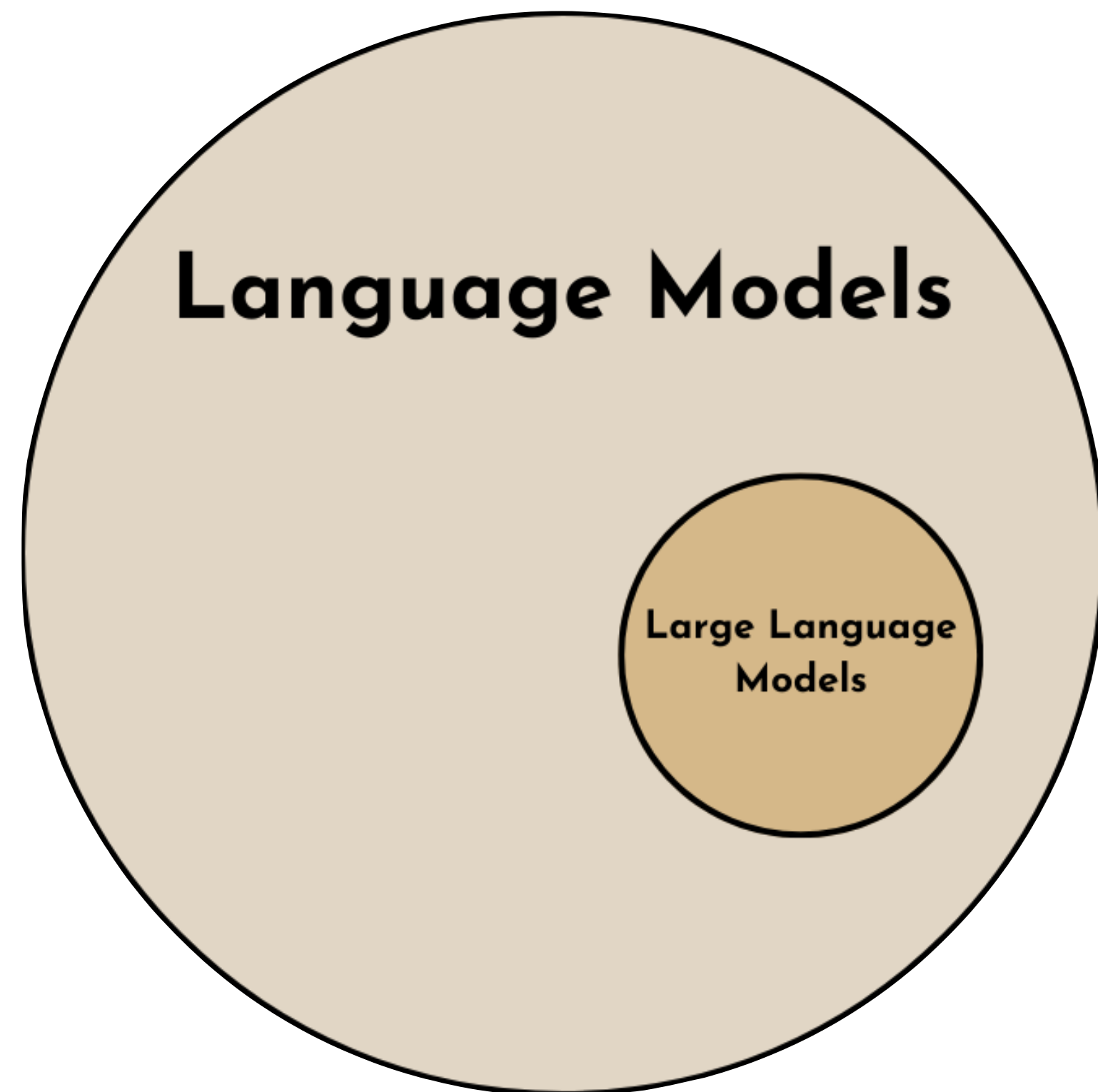
# What is an LLM?

LLM = Large Language Model



# What is an LLM?

LLM = Large Language Model



## Quantitatively

Number of model parameters  
i.e. ~10-100 Billion

## Qualitatively

*Emergent properties*<sup>[1]</sup>  
i.e. Zero-shot learning

# Zero-shot Learning

The capability of a (machine learning) model to complete a task it was not explicitly trained to do

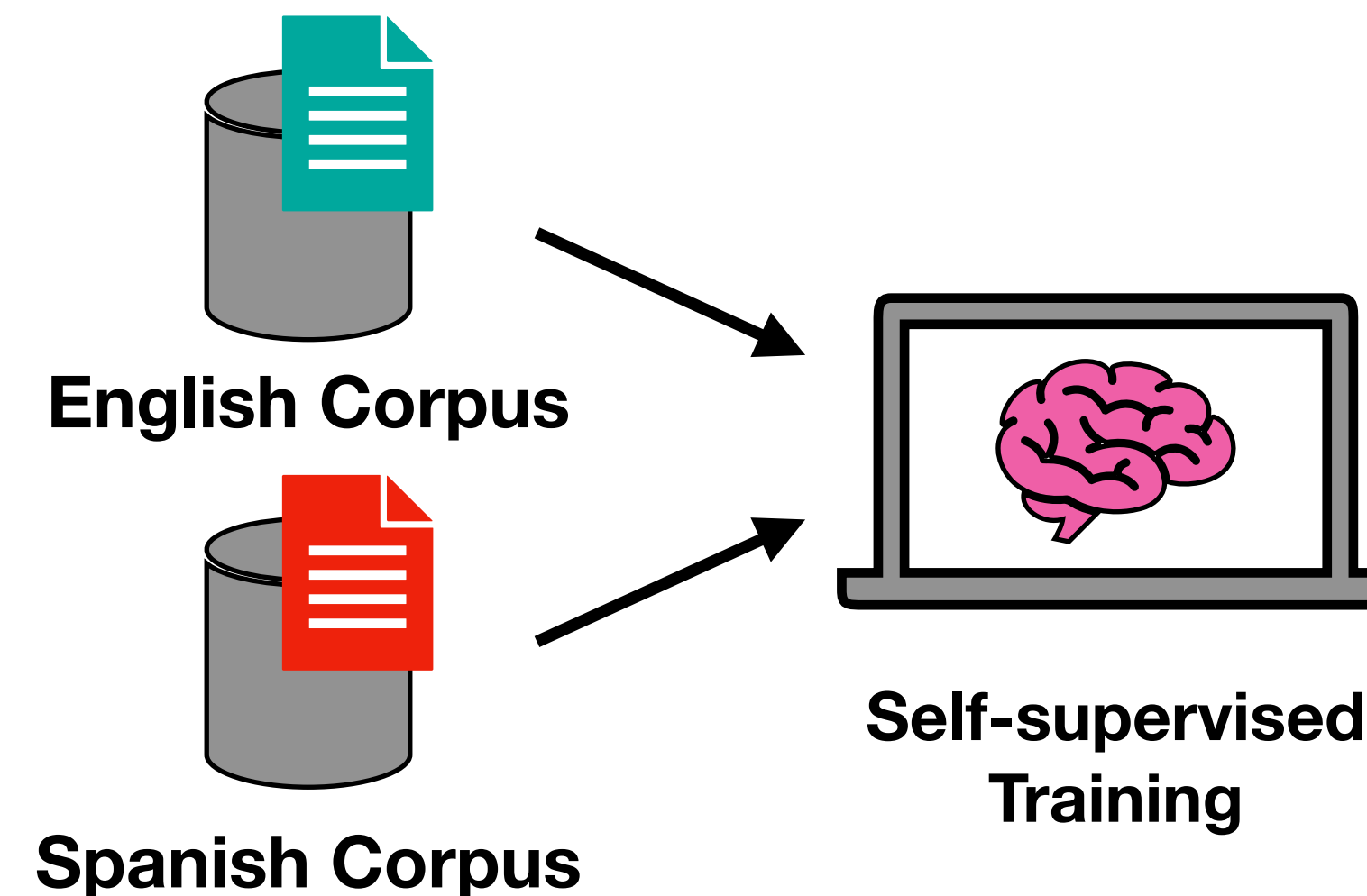
## Old Way (Supervised learning)

Train model on 1k-1M labelled examples

Input	Label
Hello	English
Hola	Spanish
How's it going?	English
...	...
Esta Bien	Spanish

## New Way (Self-supervised learning)

Train (very large) model on (very large) corpus



# Zero-shot Learning

The capability of a (machine learning) model to complete a task it was not explicitly trained to do

## Old Way (Supervised learning)

Train model on 1k-1M labelled examples

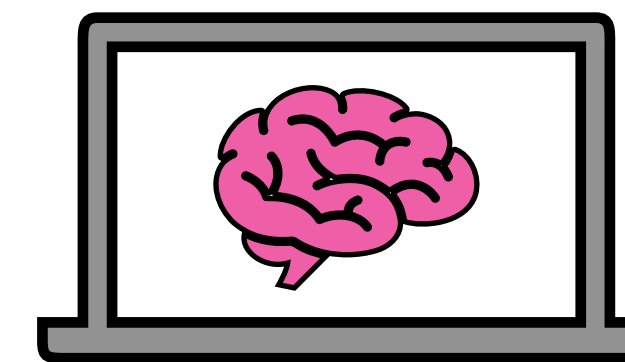
Input	Label
I hate you	Negative
Love this	Positive
U suck	Negative
...	...
Great job	Positive

## New Way (Self-supervised learning)

Train (very large) model on (very large) corpus



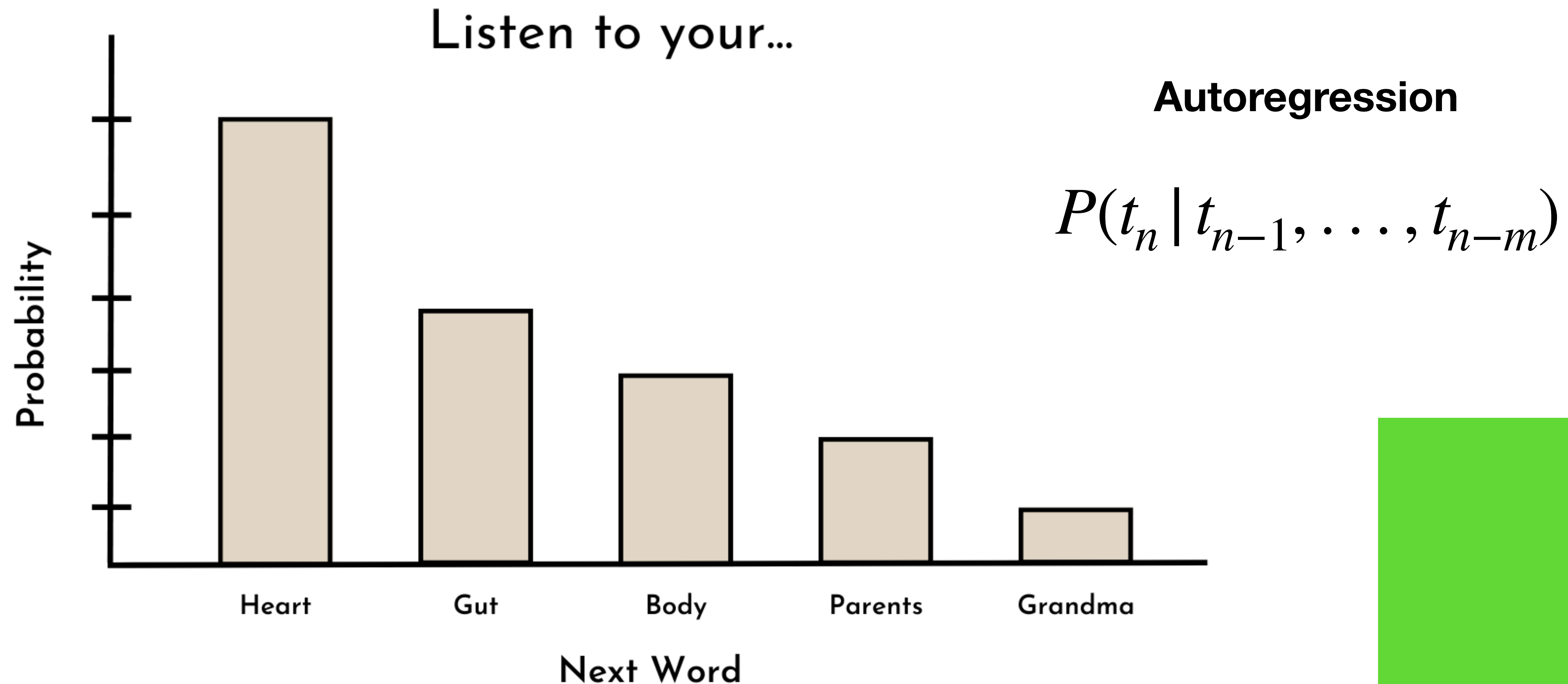
Text Corpus



Self-supervised  
Training

# How do LLMs work?

Next-word prediction paradigm



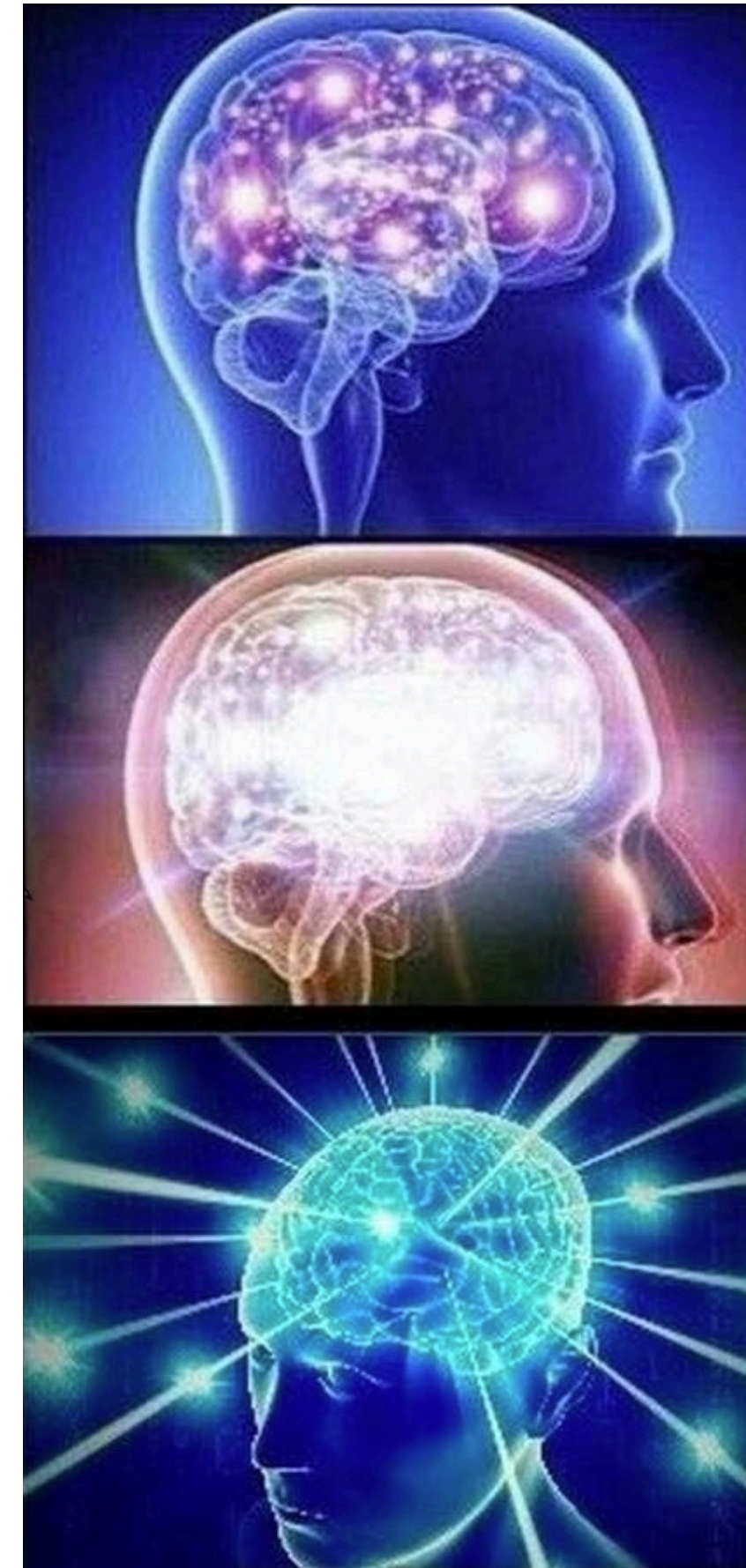


# 3 Levels of Using LLMs

**Level 1:** Prompt Engineering

**Level 2:** Model Fine-tuning

**Level 3:** Build Your Own

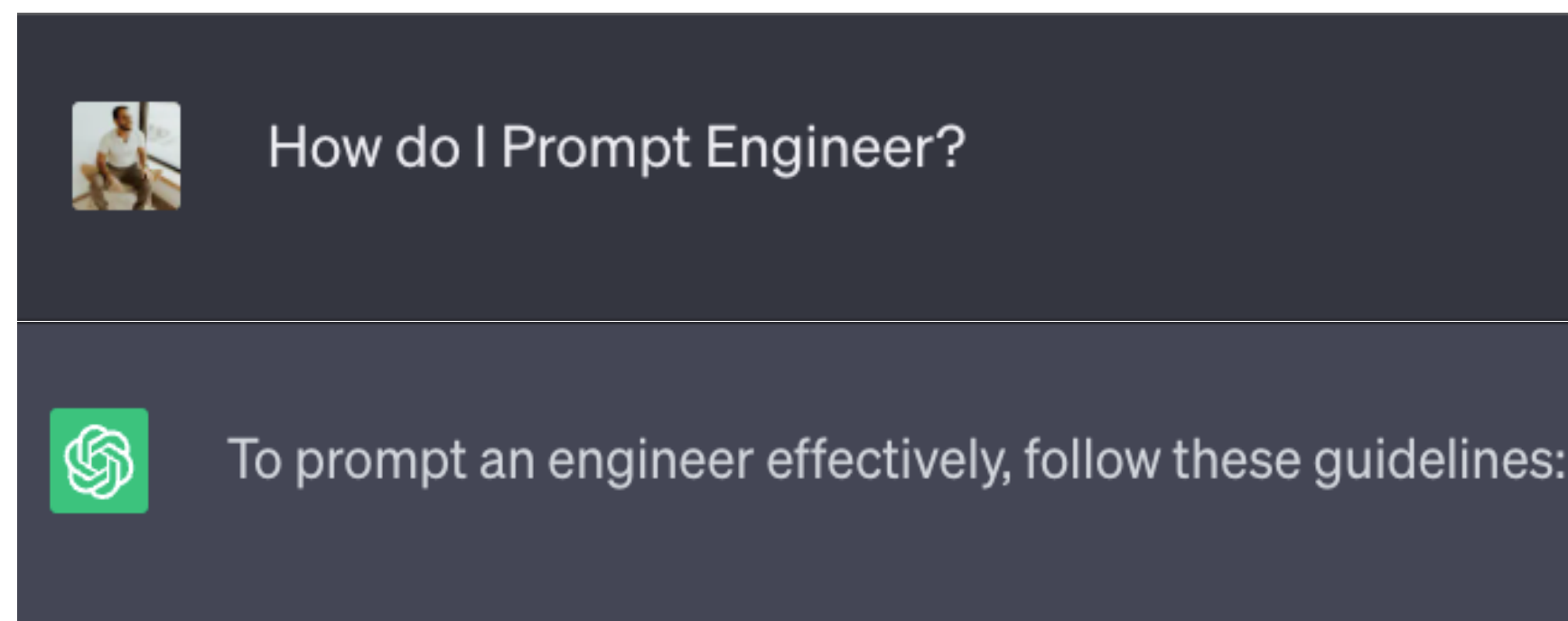


# Level 1: Prompt Engineering

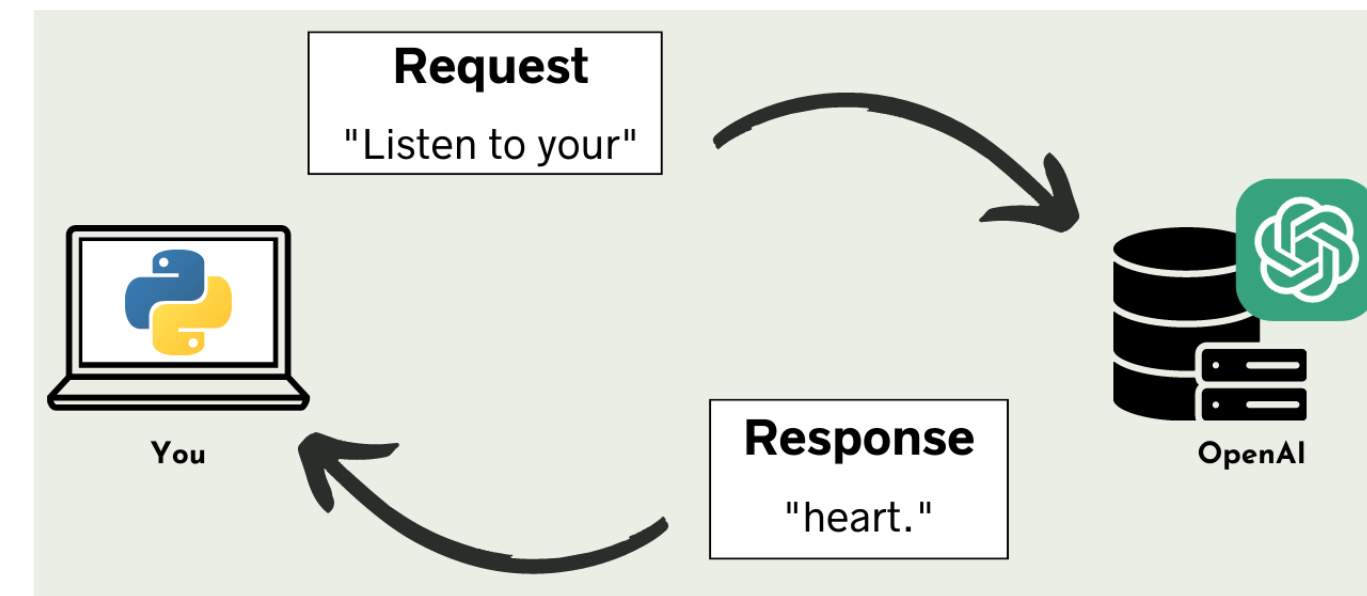
Using an LLM out-of-the-box (i.e. not changing any model parameters)



**Easy Way**  
(ChatGPT)



**Less Easy Way**  
(OpenAI API, Hugging Face)

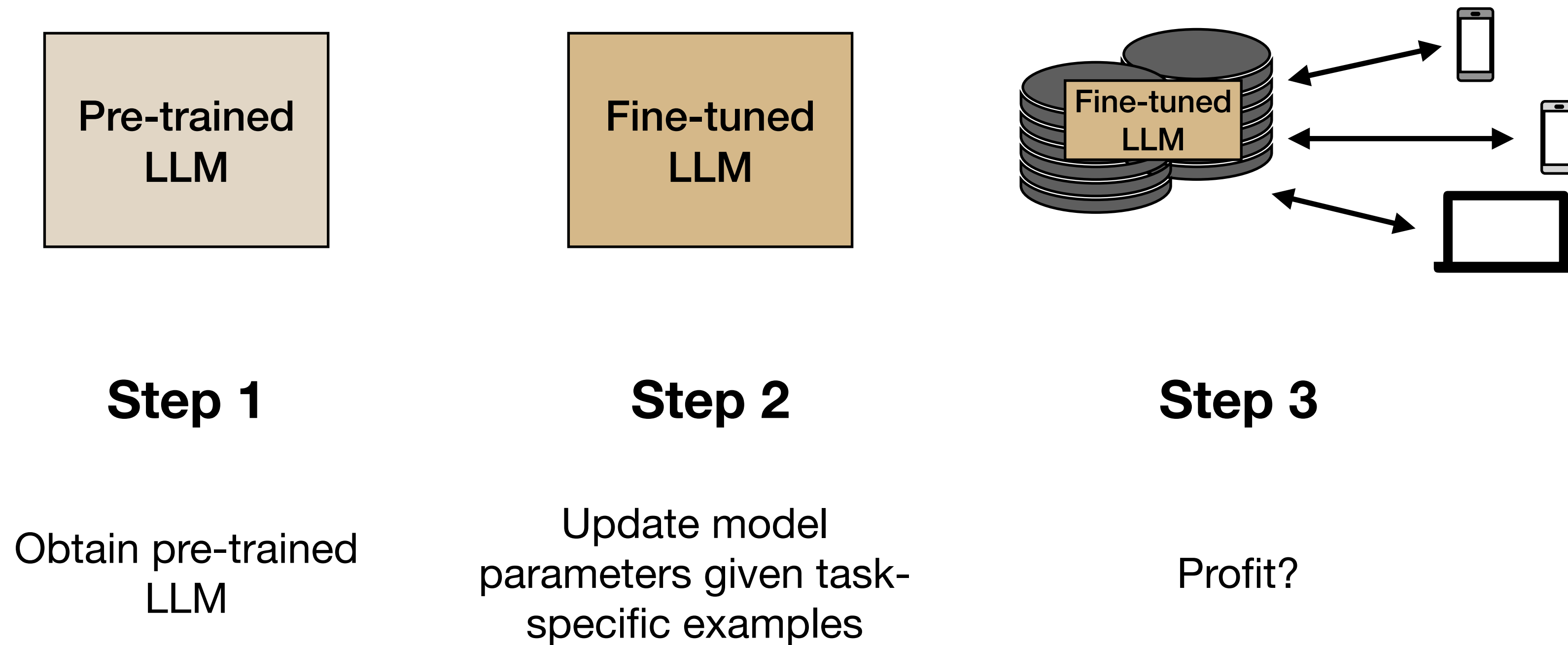


**Hugging Face**



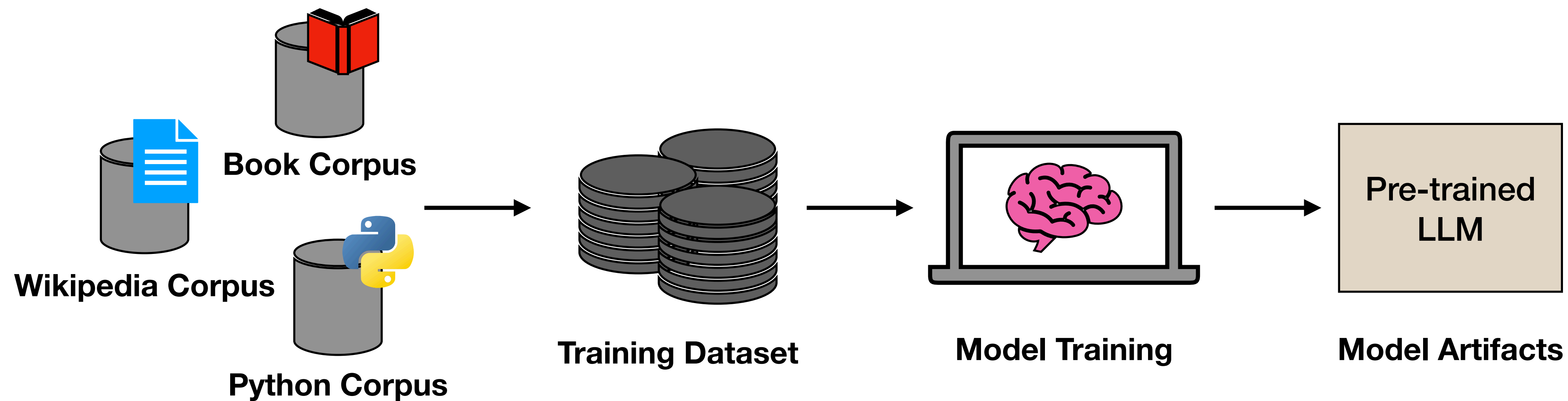
# Level 2: Model Fine-tuning

Adjusting at least 1 (internal) model parameter (but not all) for a particular task



# Level 3: Build your own LLM

Come up with all model parameters



# A Practical Introduction to LLMs



3 levels of using LLMs in practice



Shawhin Talebi

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This is the first article in a series on using Large Language Models (LLMs) in practice. Here I will give an introduction to LLMs and present 3 levels of working with them. Future articles will explore practical aspects of LLMs, such as how to use OpenAI's public API, the Hugging Face Transformers Python library, how to fine-tune LLMs, and how to build an LLM from scratch.

