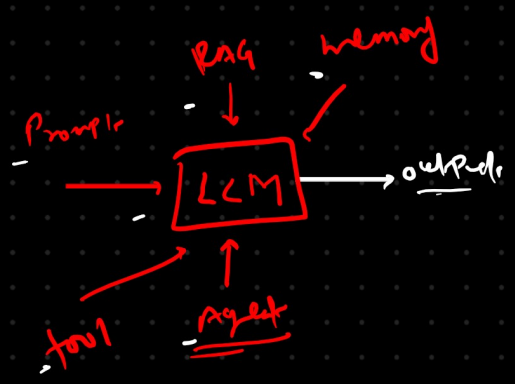
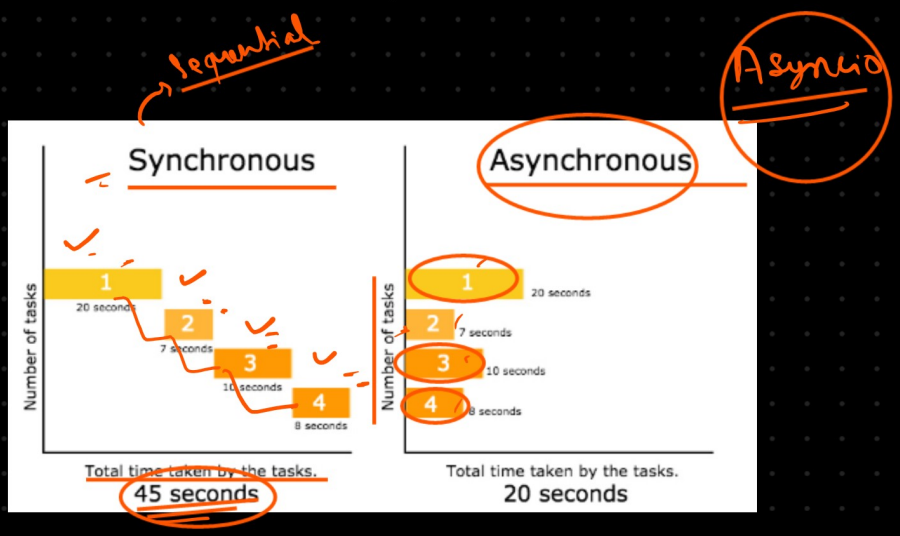


Prompt + LLM = output

Prompt + LLM + StructParser = output



Any

1. Finetuning basic
2. Roadmap
3. LM (Bert, T5 ....)
4. LLM (gpt, Llama, mistral)
5. quantization
6. RLHF (DPO, PPO, KTO)

10-1

SFT → LoRA, qLoRA } PEFT

Scratch → huggingface → NLP

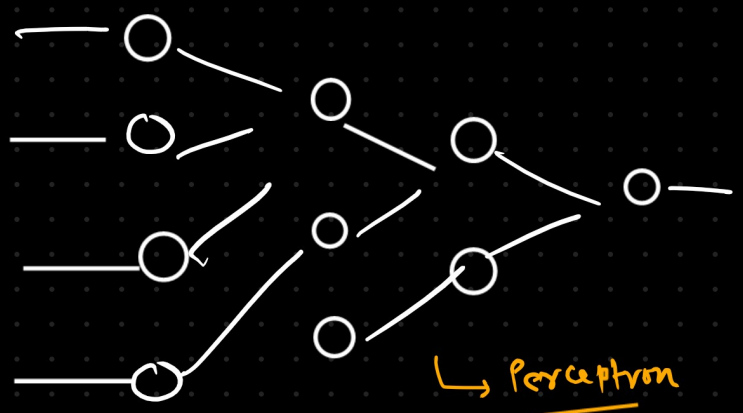
LLM =

Langchain → so many

Langraph

LLM → NN

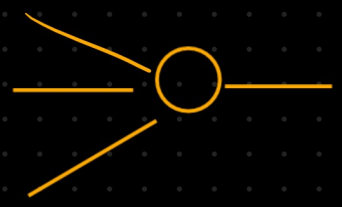
ANN



↳ Perceptron

CNN → Convolution

RNN → Recurrent



NN ⇒ weights & biases } Parameter

data → train

fine tuning

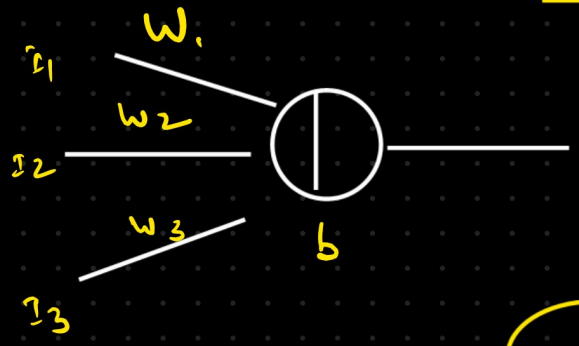
retrain

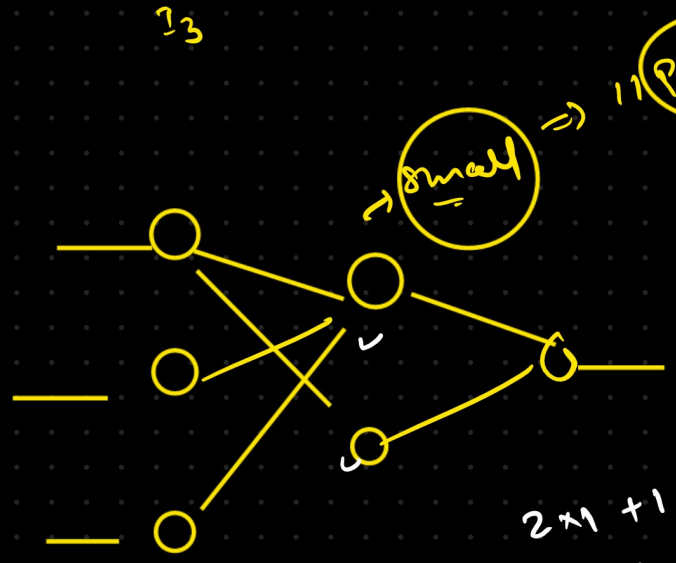
Neural Net -

w_1, w_2, w_3, b

↓

Parameter = 4





small ⇒ 11 Param

Params

?

$3 \times 2 = 6 + 2$

8

$2 \times 1 + 1$

$2 + 1 = 3$

$8 + 3 = 11$ → Parameter → 11 trainable Param

NN ⇒ X

Parameter → trainable Param

↳ (w & b)

GPT3 ⇒ 175 B

Llama ⇒ 2B, 7B, 40B, 400B

mistral ⇒ 2, 1.5, 7B, 8B, 80B

Gemini ⇒ Gemini 1.5 pro ⇒ 175 B.

Claude ⇒ Billion

Billion → Size of the model + Data

training → start

You, I, small org.

bigger models

Resource

data

10

N

LLM → training → huge Param (Billions)

Pretrain → huge data

(gpt, Llama, mistral)

transformer

- Attention ⇒ weight matrix w & b

params

NN

Base unit

(Foundation model)

Data → Transformer → Unsupervised pretraining → Supervised fine tuning → RLHF

(Labelled data training)

Commercial

LLM

Pattern

Web

Retrain

Corona

medical data → Model → Fever, basic allergy

Model → o/p

Model → ✗ fail

will be adjust

Corona data

Corona Data

Web

Data → Model → new version of model

Fine tuning → retraining → new data → (adjusting web)

Parameter

LLM → fine tune

→ parameter (retraining)

175B

training → big gamut

LLM → Pretraining → SFT → RLHF

GPT → web data → conversational data

Gemini, GPT

Gov fine

foundational

LLM → Pretraining → SFT (label) → RLHF

(unlabel)

full parameter

retrain

entire data

LORA, QLORA

DPO, PPO

PEFT → subset of parameter

Llama, mistral

fine tuning → retraining → Params → Data

domain specific

gpt ⇒ model

SFT ⇒ (instruction finetuning)

Question Answer

Finetuning

Parameter (w&b)

Retraining

Domain specific data

NN ⇒ train ⇒ Saved ⇒ Load ⇒ retrain

mnist

(100)

New data

I can retrain ⇒ full

partial ⇒ last

⇒ last 2 layer

Finetuning

LM v/s LLM

- Raw
- Grm
- Grev
- Mistrom

transformation

huge data

LLM (Bert) Million

T5

BERT, GPT

billions

Gemini, Llama, GPT-4

Billion

Pretraining ⇒ foundational

LLM ⇒ ✗

Data ⇒ Not label ⇒ training

unsupervised training

Bert → foundational → Supervised Pretraining

Llama –

T5

mistral

⋮

N

RPS

Scratch

Load

Learning ⇒ foundational

↑

unsupervised

SFT

Fine tuning

chatgpt

GPT → 3.5

① unsupervised Pretraining

② Supervised fine tuning

③ RLHF

Post training (Answer)

RLHF

unsupervised

SFT

SFT ⇒

customdata

Label data

SFT

full fine tuning

instruction (Prompt) → SPT

PEFT (LORA + QLORA) + Quantization

SFT => Supervised Learning

Label data

I/P — Q

O/P — A

Parameter → LLM → Subset

OpenAI → gpt

→ Load weights → infer

Q/A ← SFT → optimization

data

Foundational => Unsupervised model

Pretrain model

xyz

org

Community

Cdata

text classification

SFT

Question	Answer

RLHF

Llama, mistral, Zephyr or any model

Instruction

LLM

early stage llm

latest llm

ULLM

NLLM

Pretraining = Pretraining

PEFT → LoRA, QLoRA } quantization

Bert-
TS
Paper
Sum

PEFT

NN → train → save → load → Inferencing

Model ⇒ Pretrain (unsupervised Pretraining)

↓

load model (w4b) Param

↓

Data → (Model) → output

Input

output

Inferencing

Prediction Pretrain → load → Data ⇒ Prediction

output

Inferencing ⇒ difficult ⇒ huge ⇒ huge

Llama 3.1 → Infra

quantization

quantization → fast inferencing

(?)

Inferencing

↓

Prediction

Model → head

(w4B) → Parameter

access → API ← infra

Kaggle

- Dine (hDD, sDD)

BERT