GenAI

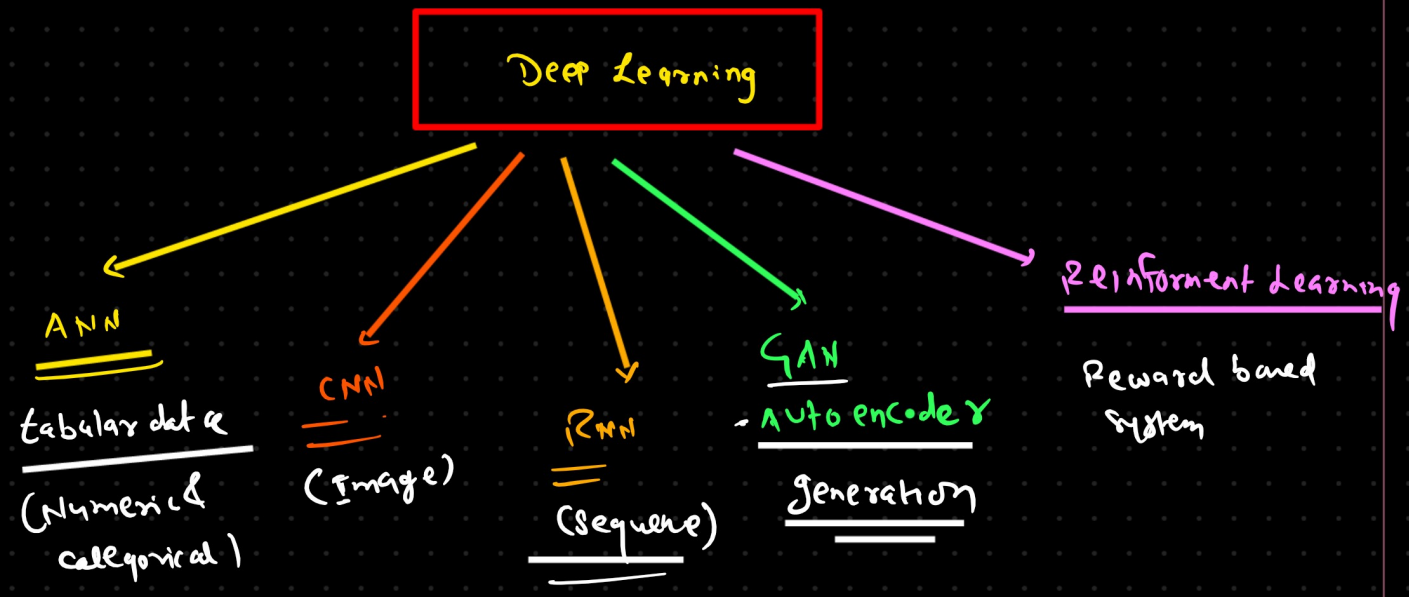
text data (PreProcessing, Encoding, embedding)

Model (RNN, LSTM, GRU, EFD, transformer)

LLM, Finetuning (Pytorch)

GPT-2,3 → Scratch (Pretraining)

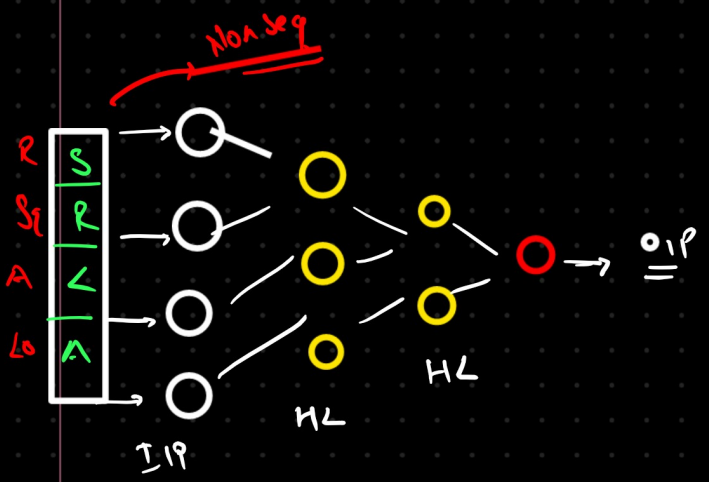
→ RAG, Agent



Data → Nonseq

→ Seq

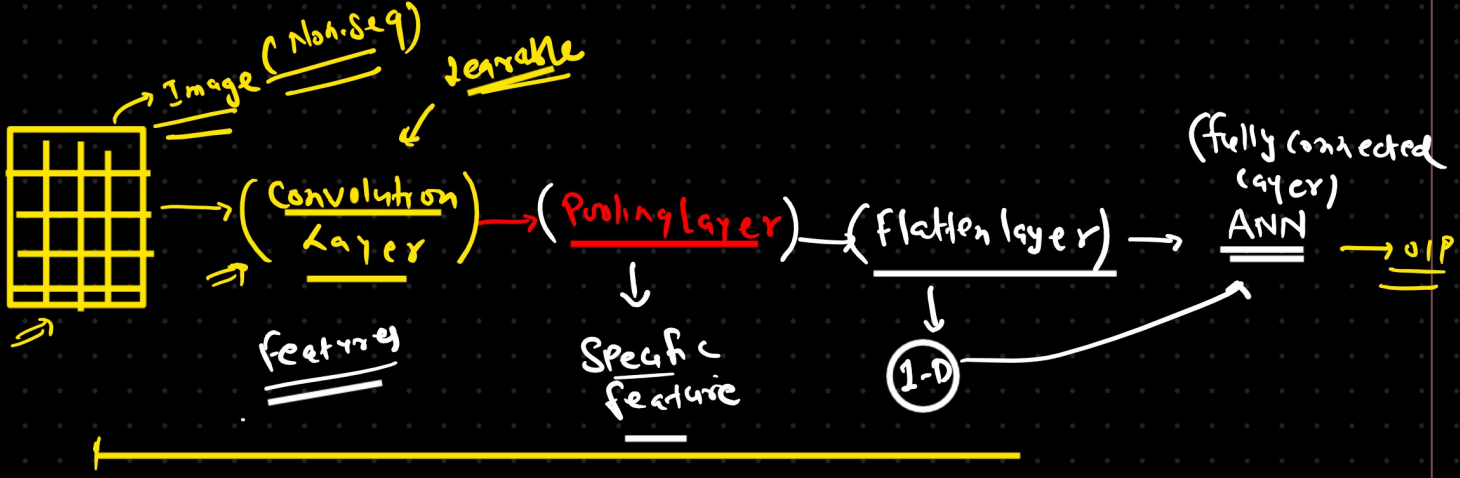
ANN



Numkal' House Price

Sqfeet	Rooms	Location	Area	price

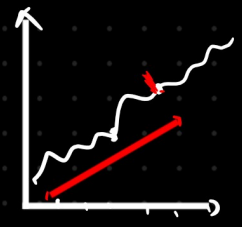
CNN (Image)



RNN ⇒ Sequence data (Sequence) RNN

- My name is Sunny Savita → text data, context
- Sunny my name Savita is

Seq
1. Text
2. Timeseries
3. Speech. → .wav



4. DNA Sequence

wavelength

⇒ Mathematical Proof X ⇒ DL

⇒ Conceptual things

Base

RNN → LSTM → GRU → type of seq to seq learning → EED → ERd attention

→ Stacked RNN

→ Bidirectional RNN

(seq data)

text

RNN
LSTM
GRU →

1. one to many
2. many to one
3. many to many ←

⇒ (transformer)

(ERd)

Synchronize

Fix Path

(Asynchronize)

⇒ (variable length) ⇒

⇒ Summarizing

⇒ QA

⇒ Conv AI (Chatbot)

RNN

IIP

Hi my name is Sunny
I Love AI
India Lose the match

OIP

0
1
0

⇒ Data.

Preprocessing ① Cleaning
② Number (vector)

⇒ Model

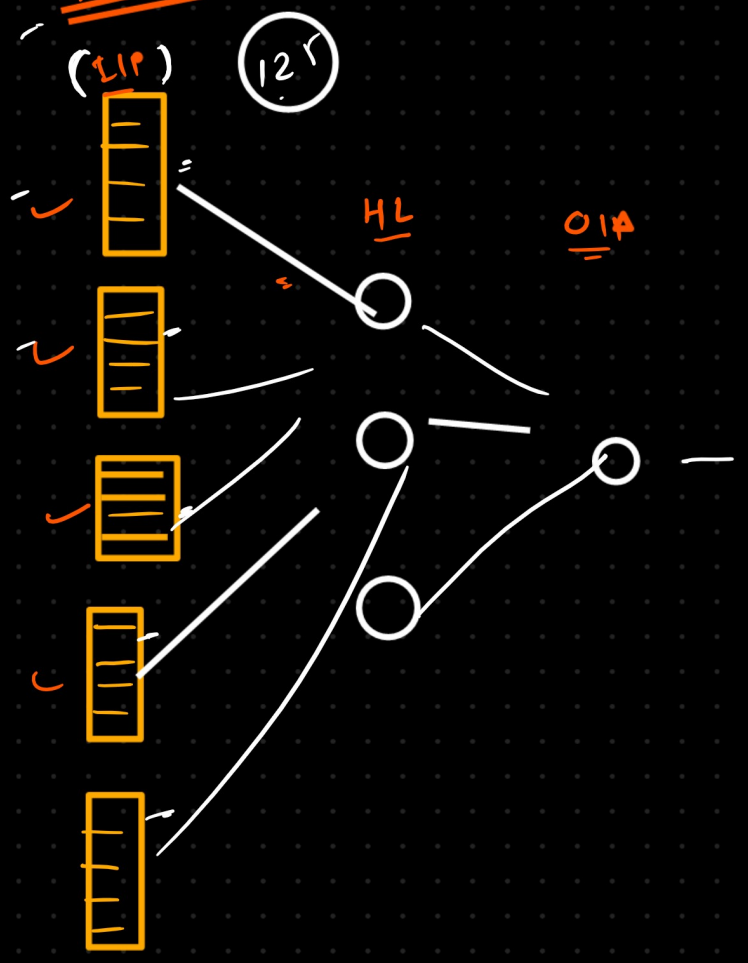
⇓

Vocab

≃ {12} ← unique

OHE ⇒ Basic encoding technique

[1,0,0,0,0 ----]
[0,1,0,0,0 ----]
[0,0,1,0 ----]
⋮



text ⇒ ANN

① text input variablity

② Context is not being preserved.

Vocab => 5

50 x 1000 = 5000.

vocab => 1000

(longest => 50 sentence)

Smallest : 5 words

45 zero

Computational

200

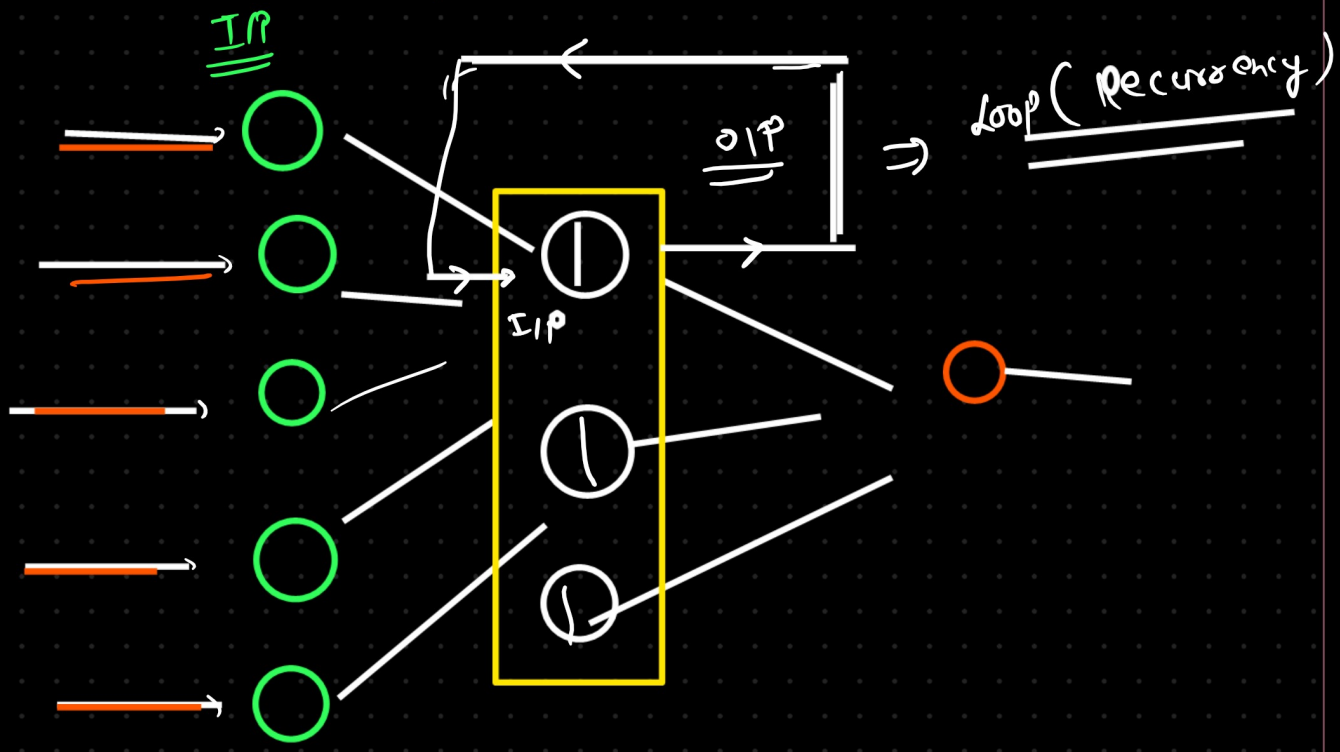
RNN

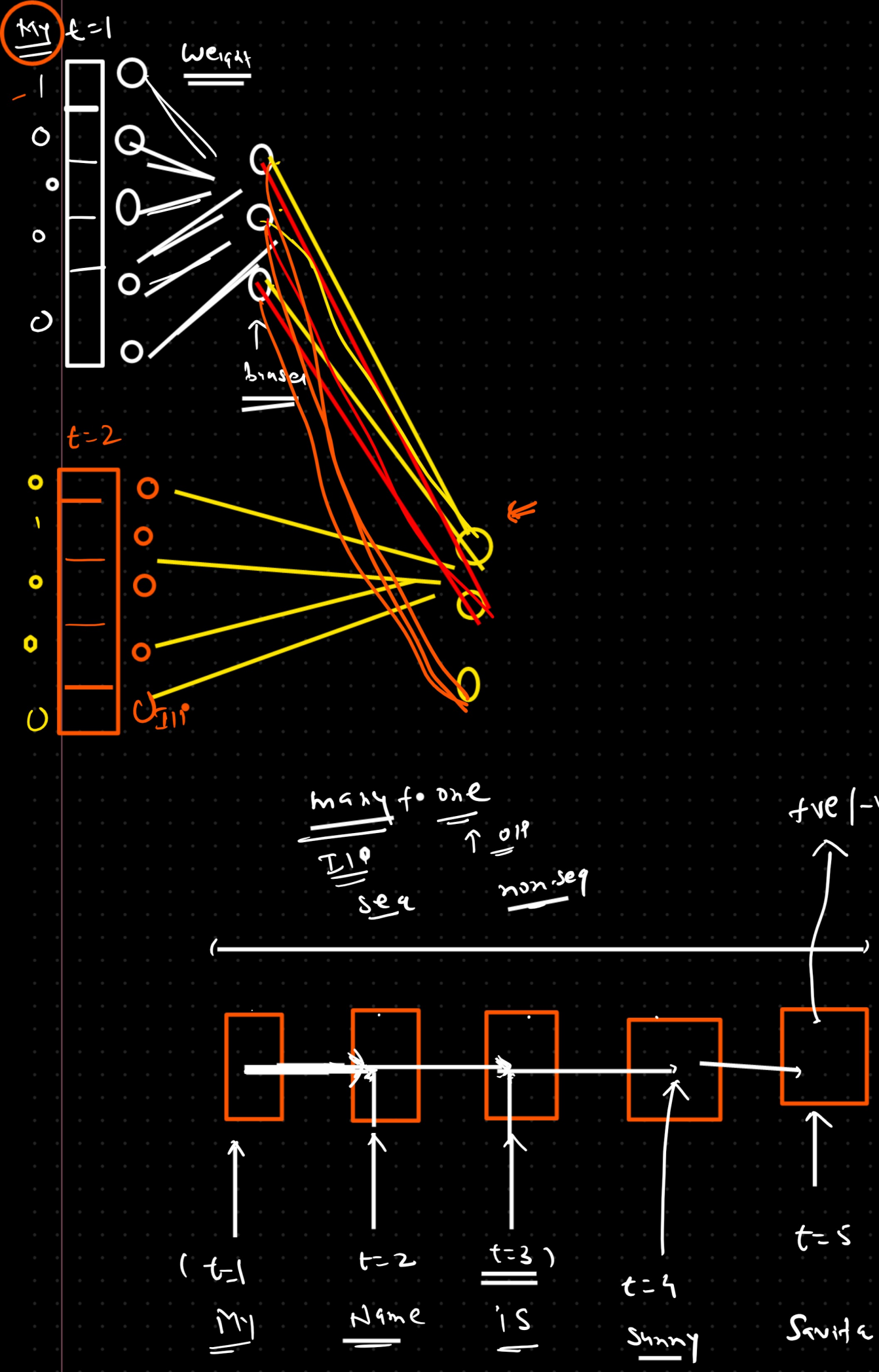
Fixed length IIP

my name is Suraj	+ve/1
I love AI	+ve/1
India lose match	-ve/0

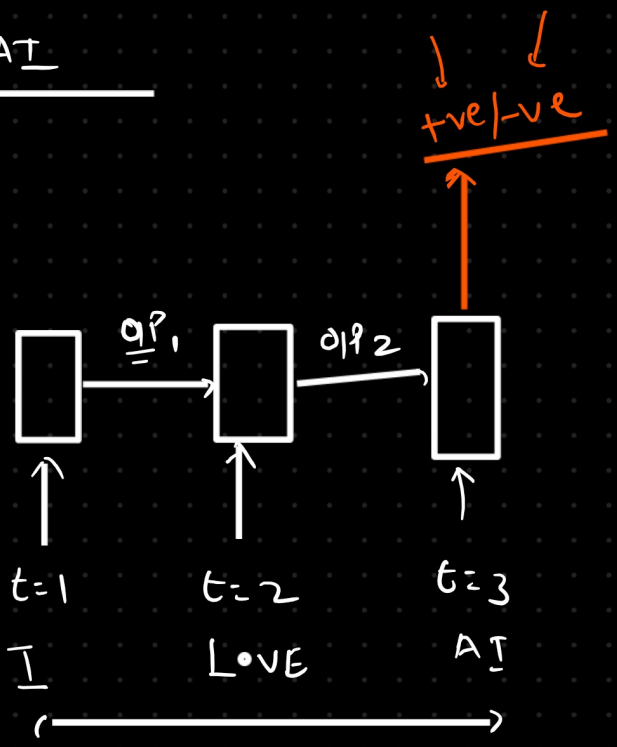
variable IIP

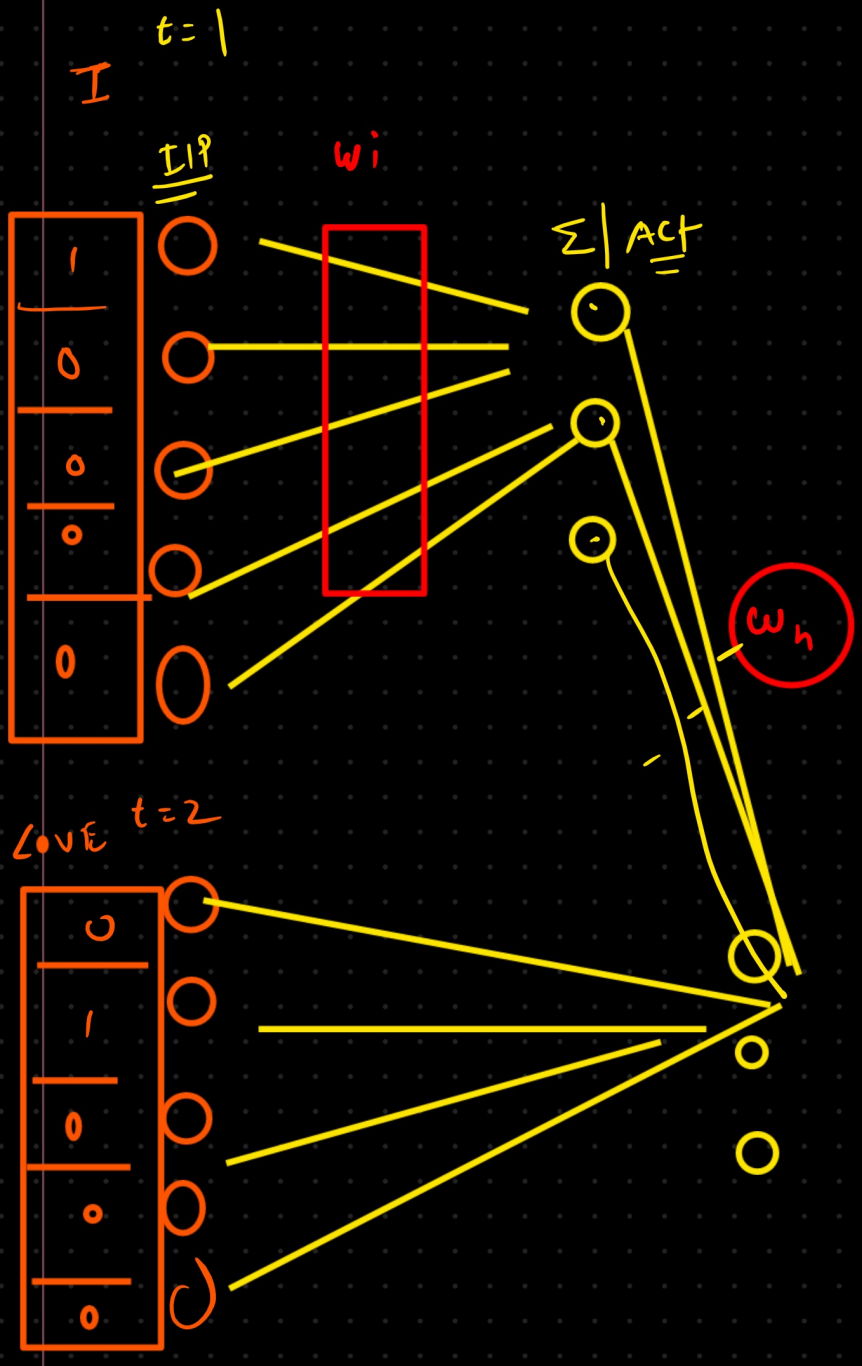
timestamp

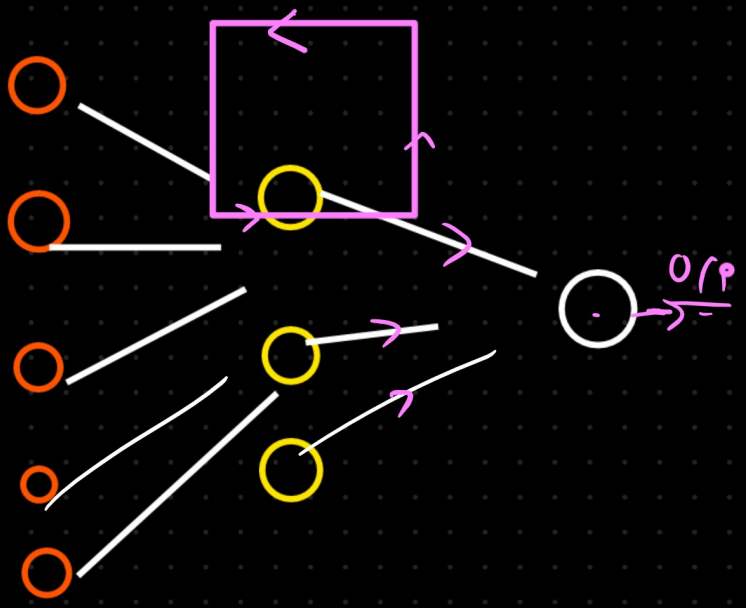


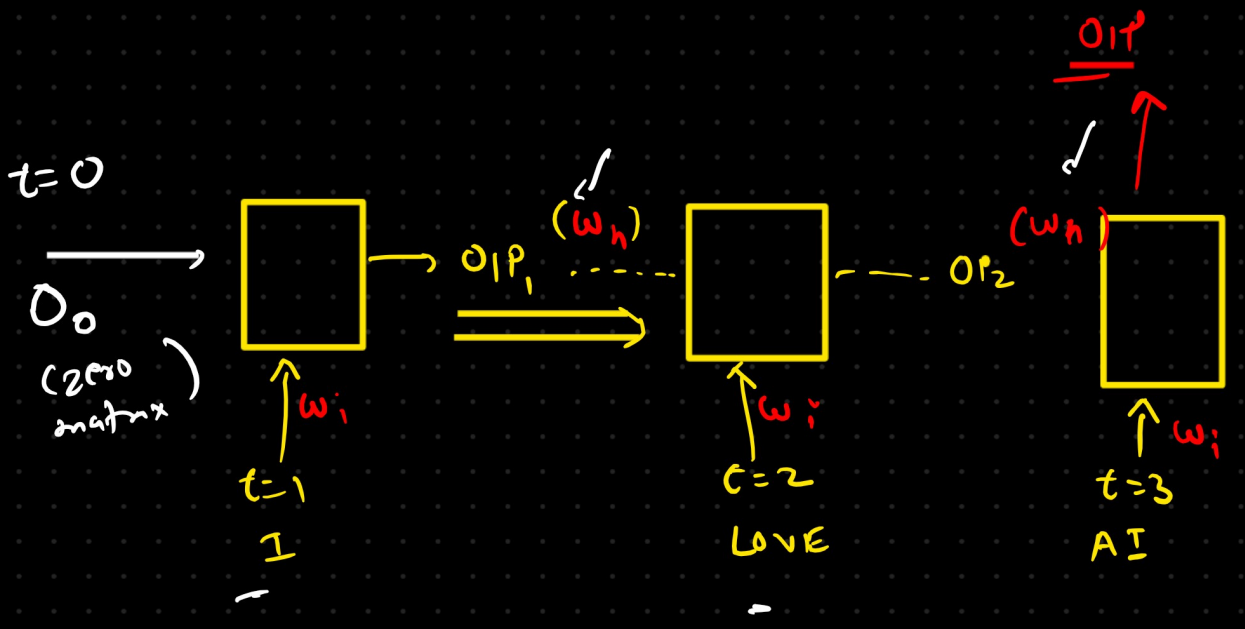

My
t=1
Weight
bias
t=2
I/P
many to one
I/P
O/P
seq
non-seq
+ve/-ve
t=1
t=2
t=3
t=4
t=5
My
Name
is
Sunny
Savita

I LOVE AI


+ve/-ve
op1
op2
t=1
t=2
t=3
I
LOVE
AI


I
t=1
I/P
wi
Σ| Act
1
0
0
0
0
w_h
LOVE
t=2
0
1
0
0
0


O/P


t=0
O_0
(Zero matrix)
ω_i
t=1
I
O/P_1
(ω_h)
ω_i
t=2
LOVE
O/P_2
(ω_h)
O/P
ω_i
t=3
AI

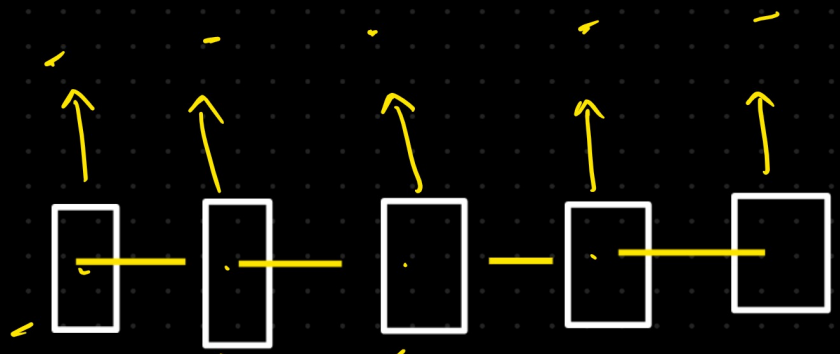
Seq to Seq

1. many to one ⇒ Text classification
   - ↑ IIP — seq
   - ↑ OIP — non seq
   - ↳ Sentiment analysis
   - ↳ SPAM / ham
   - ↳ Rating pred

2. one to many
   - IIP
   - ↑ (OIP) Seq

Image captioning

(Seq)



IIP

(Image) (CNN) Extract

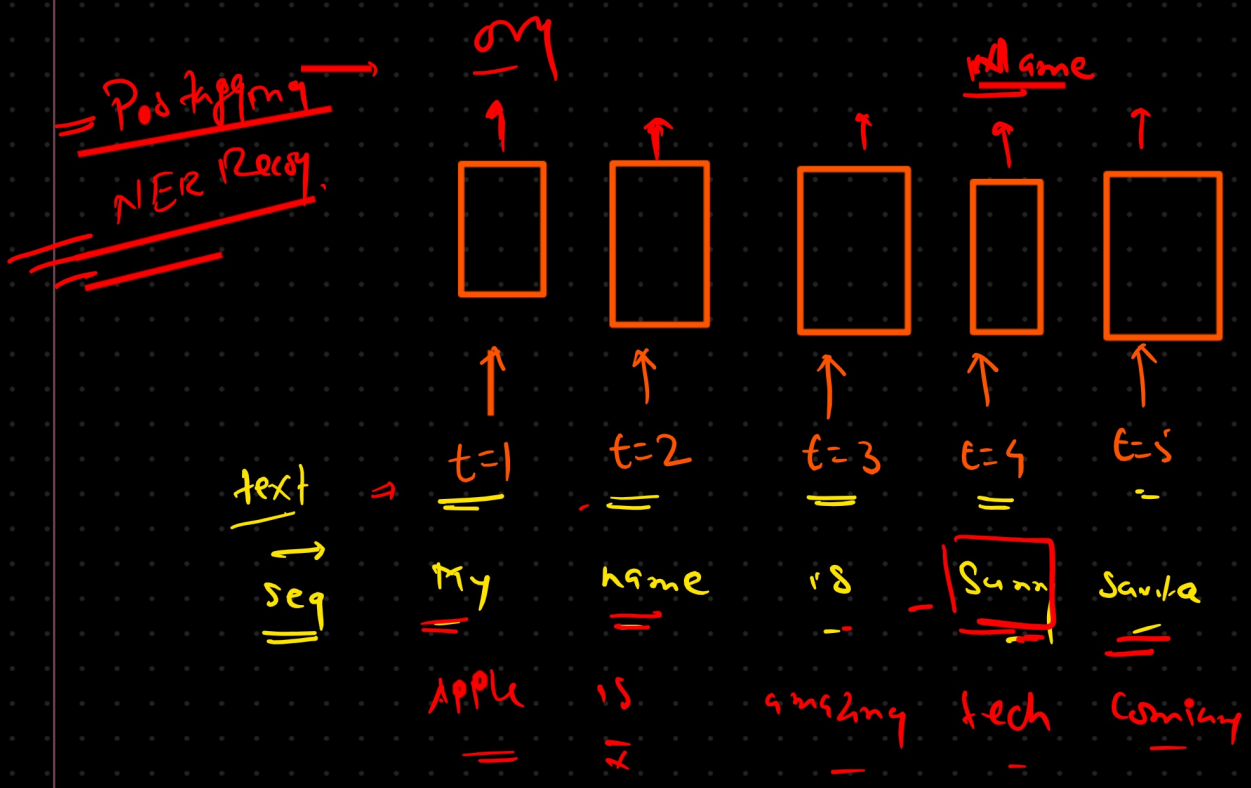
3 Seq to Seq

(many to many)

(diff seq) (seq)

⇒ Future (GenAI)

1. Fixlength



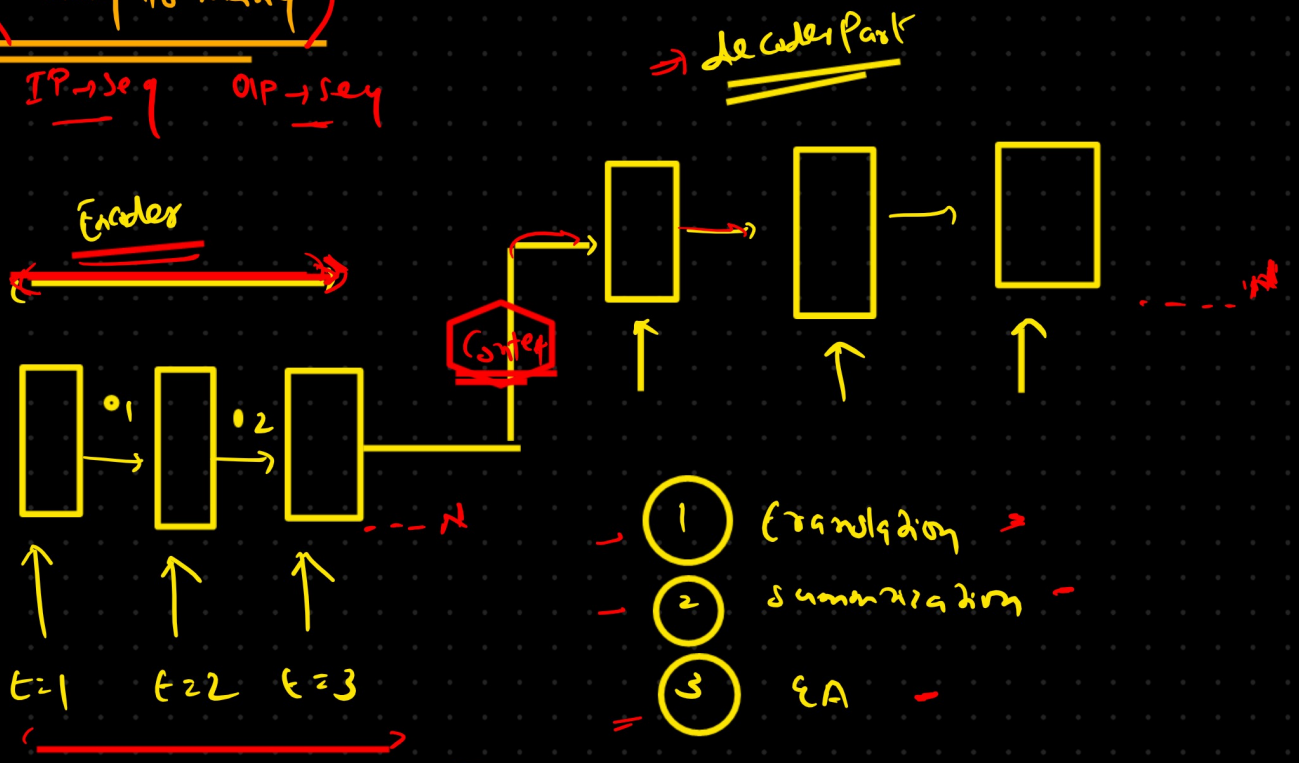
NER.

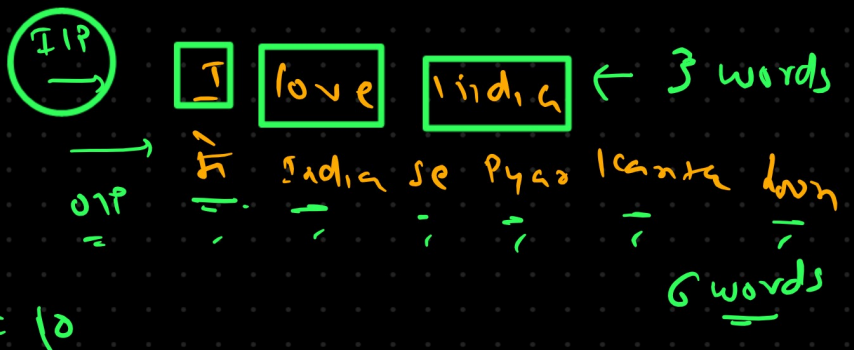
POS

many to many (variable length)

(many to many)

IP → seq OP → seq





IIP = 10

{ my name is Sunny i teach AI
I love AI }

⇓

Summarization

my name Sunny i teach & love AI ⇒ ⑧

RNN (Seq)

Seq to Seq

many to many

fixed length
variable length

Seq to Seq Data Processing

(1997-98) (2014)

RNN → LSTM → GRU

longer sentence

(Short term dependency)

(long term dependency)

Short term dep

my name is Sunny.
Sunny is AI eng
he teach DS as well

RNN ⇒

₹= 15,20

Bunglore is a coolest city in India here many people are liking the weather here food are also great. in this city people speak kannada

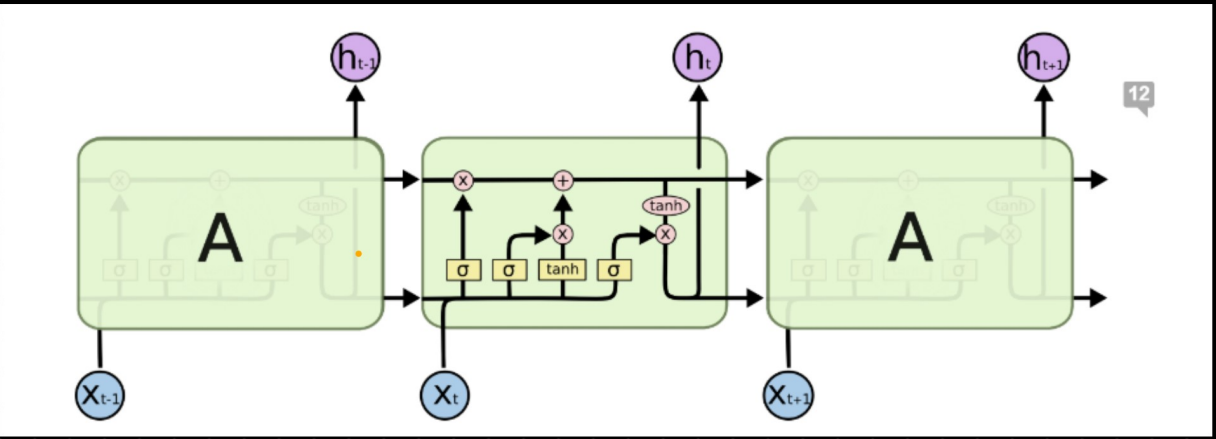
long term
short term

RNN → Problem
long term dependency ⇒ Robust arch ⇒ LSTM GRU

RNN → (Long term dependency) Calculation

→ { vanishing gradient, exploding gradient } → Small, ⇒ Large → U

→ (RNN)



- There was a king Vikram very strong and powerful
- There was an enemy king kaali
- Both had a war and kaali killed Vikram
- Vikram had a son Vikram Jr who grew up he to become very strong just like his father
- He also attacked Kaali But got killed
- Vikram Jr too had a son called Vikram super Jr and when he grew up he also fought kaali
- And he killed kaali and took revenge of his father and grand father

Context

→ LSTM

(Short) (long term)

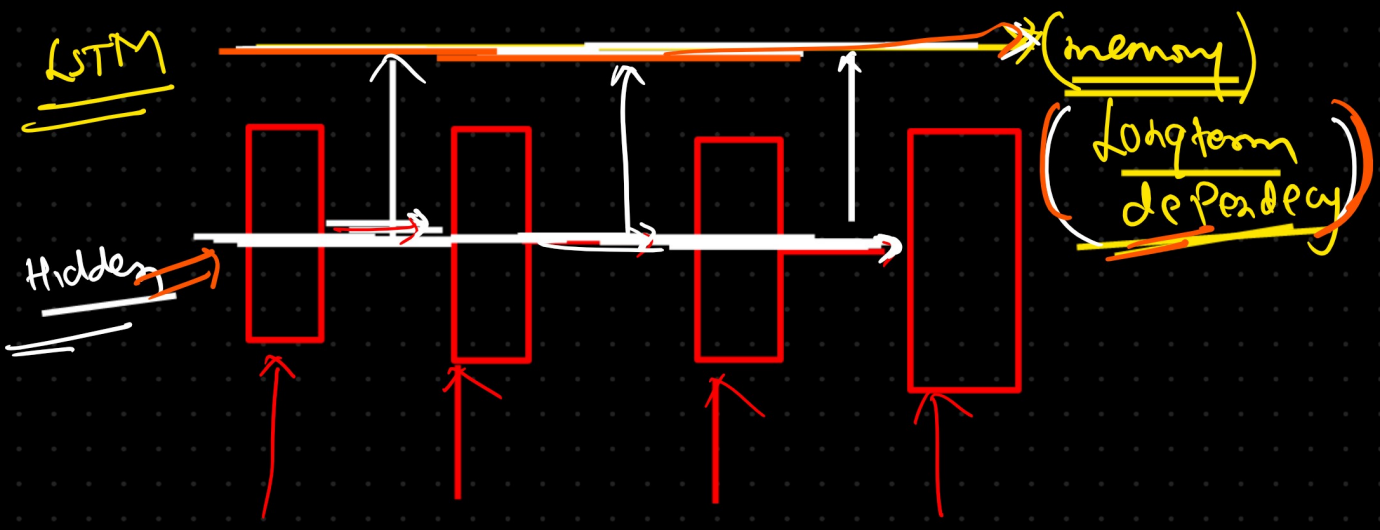
hero

(Vikram super Jr)

(Forget)

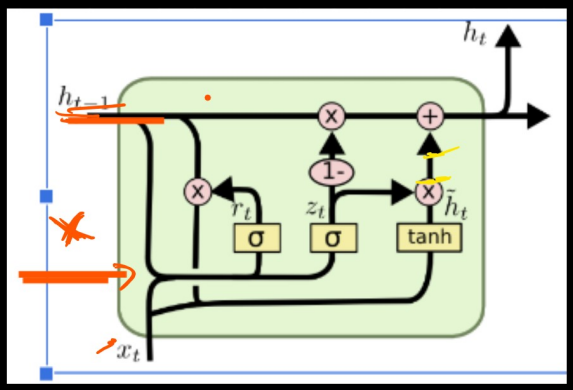
Revenge

(Ip) (Vikram super Jr)



LSTM ⇒
1. (Forget)
2. I/P →
3. O/P →

Resd & a ≠ date



1. Seq & non seq.
2. RNN
3. LSTM
4. GRU

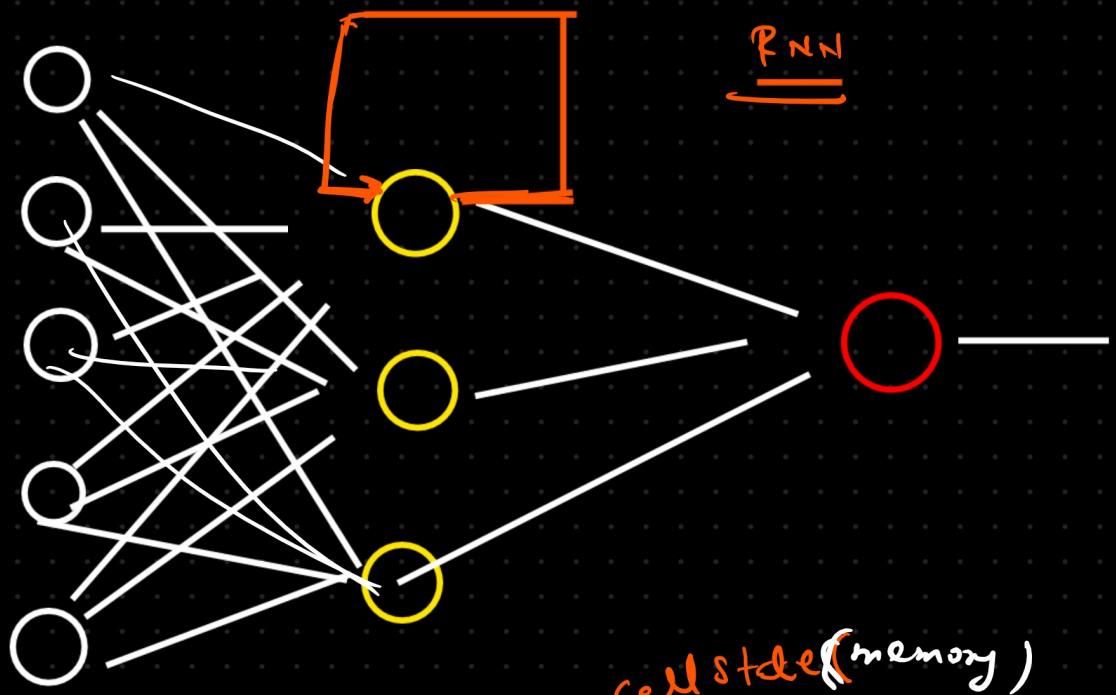
classical (LSTM)

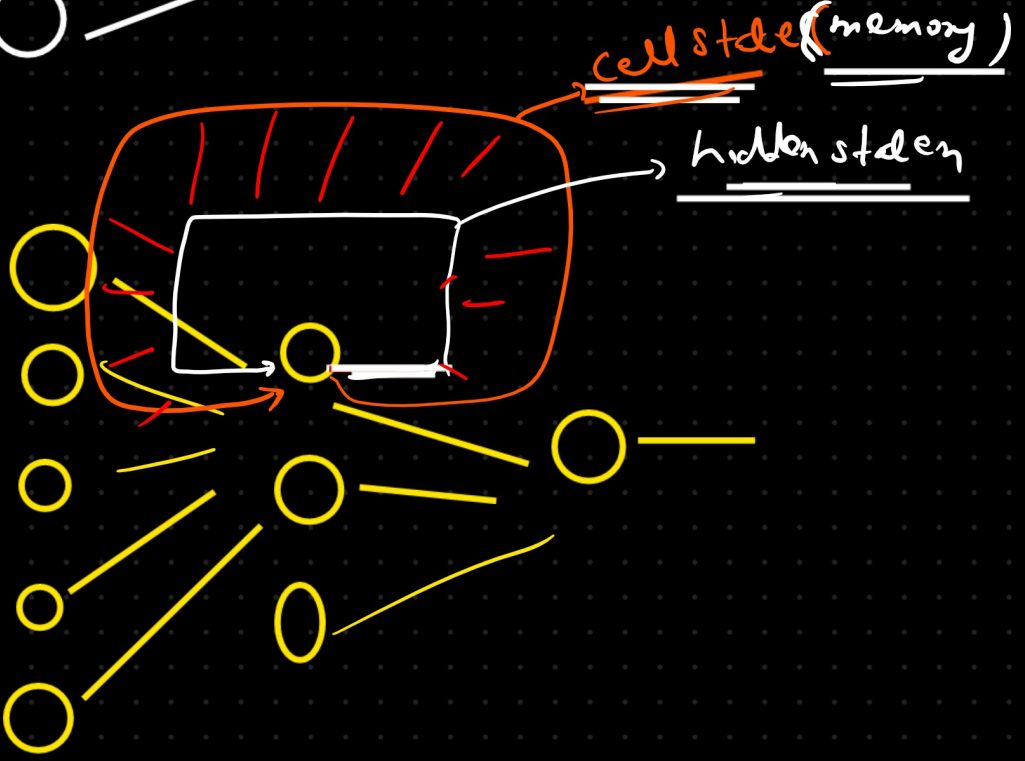
Seq to seq

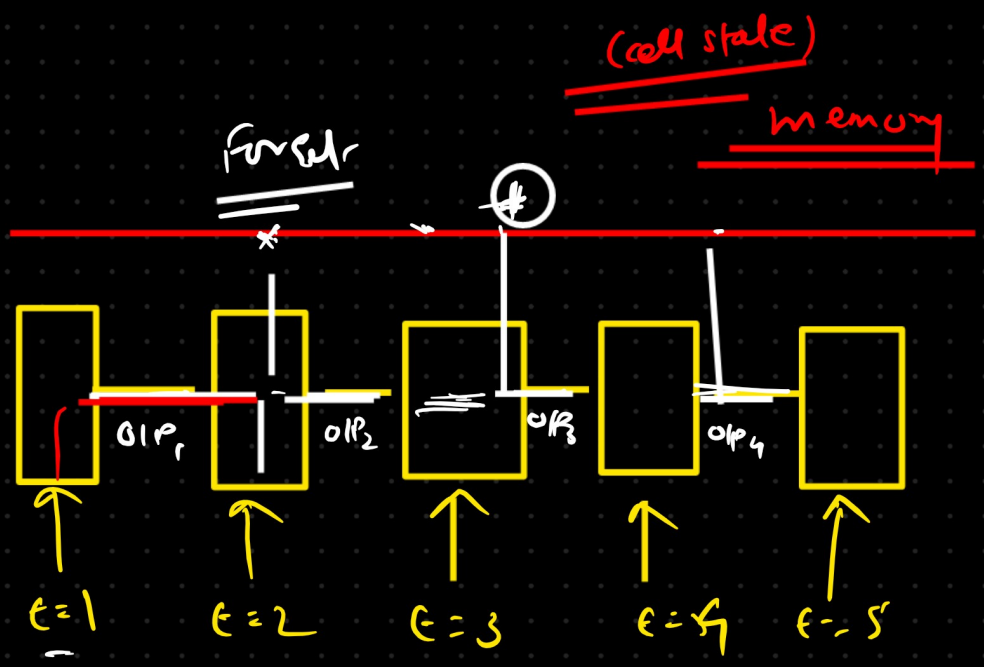
1. RNN
2. LSTM
3. GRU

V/S (transformer)

Seq manner => word by word






(cell state)
memory
forget
O/P1
O/P2
O/P3
O/P4
t=1
t=2
t=3
t=4
t=5