NOTEBOOK

_____

_____

NLP in Deep Learning

① ANN → Artificial Neural Network [→ Classification } → Tabular
                                   [→ Regression }   Data

Eg: House Price Prediction

f_1	f_2	y
House size	No. of Rooms	Price (o/p)
— —	—	—

$f_1 \longrightarrow$

$f_2 \longrightarrow$

i/p w_1 Hidden layer   Loss$(y - \hat{y})$ ↓
w_2 O w_7
w_3 w_8 O/P $(\hat{y})$
O w_4 O
w_5 w_9
v_1
v_6 O
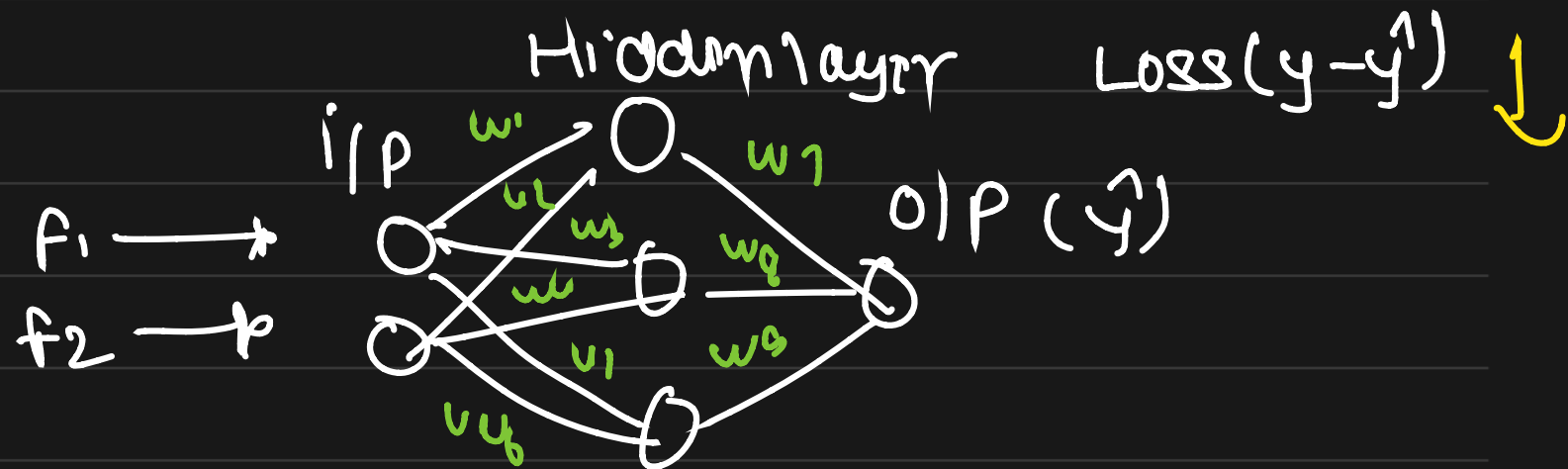
← $\overline{\text{Back propagation}}$

* sequence of data doesn't matter

② CNN → Convolution Neural Network → Data are in the
                                      form of image and
videos. Eg: Image Classification, object Detection

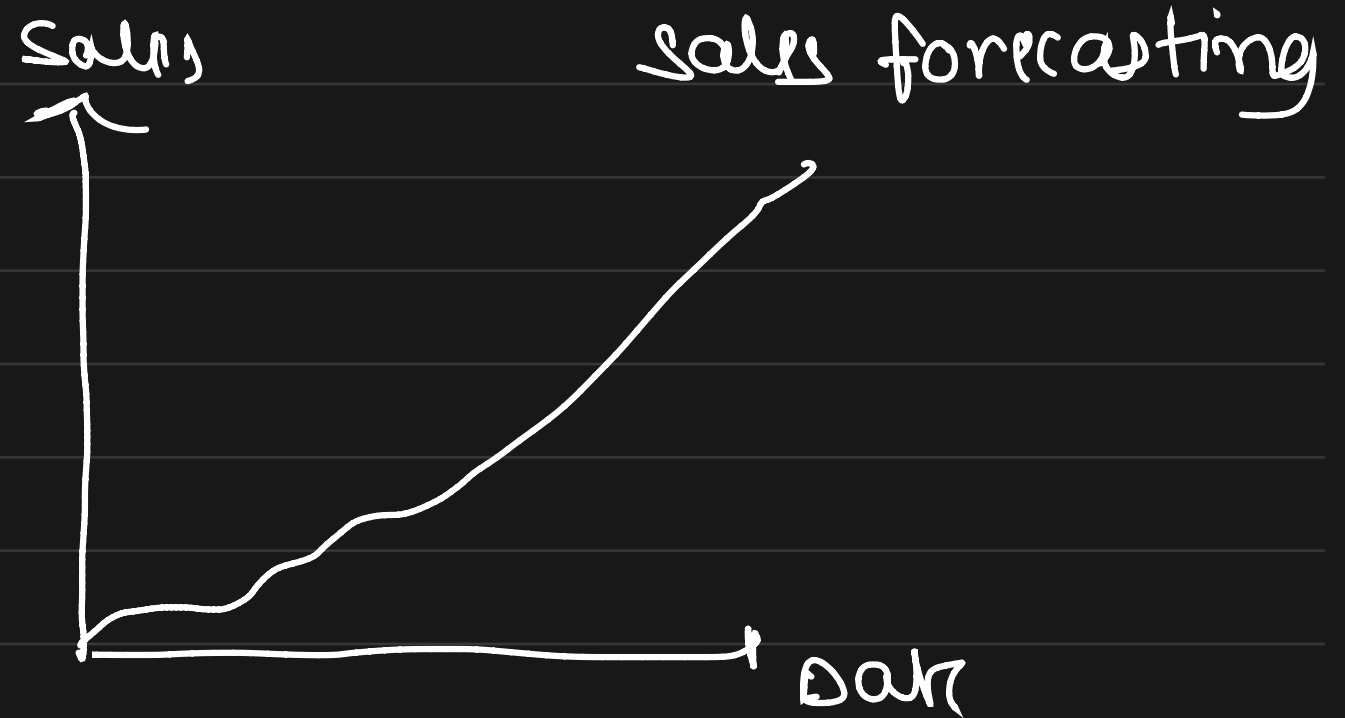11) Data → Sequential Data → Sentence should be in a sequence.
- Text Generation → IP   O/P
                    Hello how one — you?

- Chatbot Conversation → Q & A
- Language Translation
- Auto Suggestion
- Sales Data → Date Time

Sales   Sales forecasting

[graph with Sales on y-axis, Date on x-axis, curve rising]

Date

→ Can we use ANN to solve this which has sequential data.

NLP in deep learning is very important for generative AI.
It includes:

① SimpleRNN ⟶ LSTM/GRU RNN ⟶ Bidi'n RNN ⟶
Encoder Decoder ⟶ Self Attention ⟶ Transformers
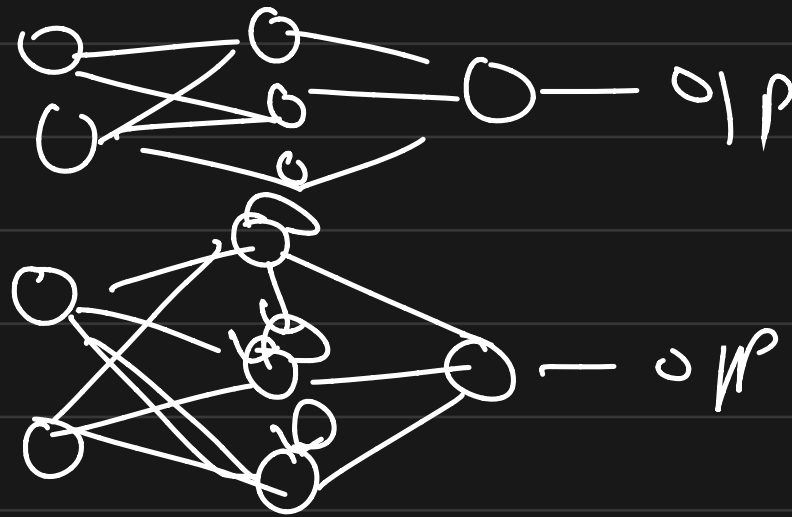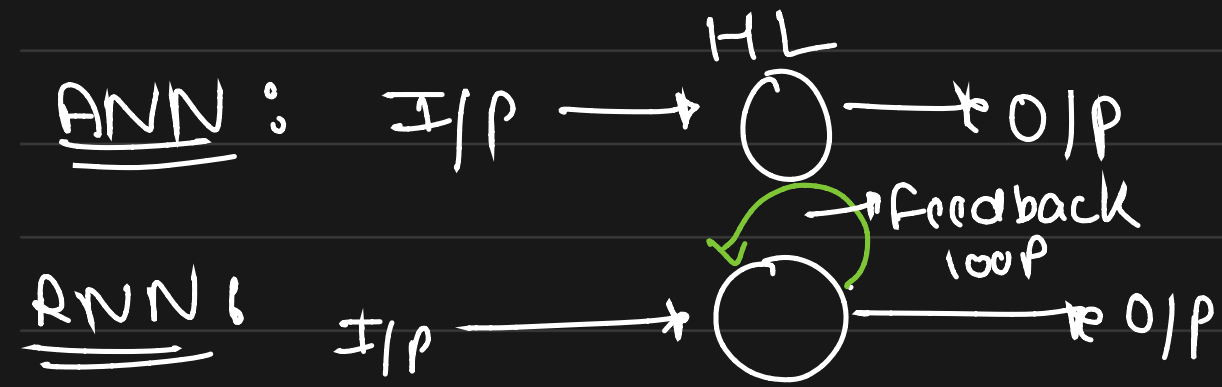
ANN V/s RNN

Dataset & Sentiment Analysisy

Text	O/P	Bow ⟶	Food	good	bad	not
food is good	1	S1	(1	1	0	0)
food is bad	0	S2	(1	0	1	0)
food is not good	0	S3	(1	1	0	1)

* sequence data is important and in ANN there
  is no sequential data.
* ANN will input all the words at once.
* Meaning of sentence is lost.

Simple RNN (Recurrent Neural Network) [Data → Sequential]

ANN: I/P ⟶ ◯ ⟶ O/P

HL

RNN: I/P ⟶ ◯ ⟶ O/P
feedback loop

In RNN, the feedback loop sends information back to it's node and respective Ht nodes.

Eg: The food is good
x_{11} x_{12} x_{13} x_{14}

$t = 1$ x_{11}
$t = 2$ x_{12}
$t = 3$ x_{13}
$t = 4$ x_{14}

↳ In RNN we pass the words in particular timestamp.