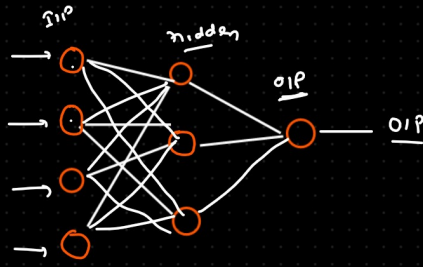
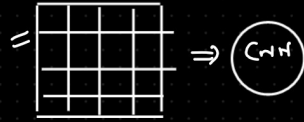


RNN

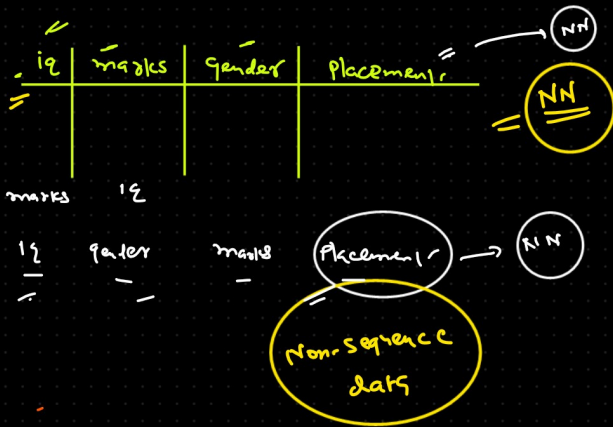
ANN →
CNN
RNN



- Regression, classification



RNN ⇒ text, audio, speech, time related data
 (sequence)

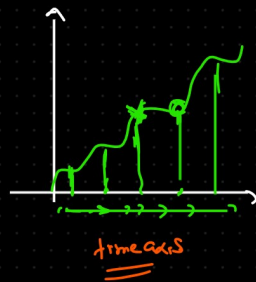


1st → my name is sunny.
 2nd → my sunny name is x

Sequence data

Ex.

- ① text
- ② time series data
- ③ Speech
- ④ QNA
- ⑤ Protein
- ⑥ Purchase history
- ⑦ Surfing history

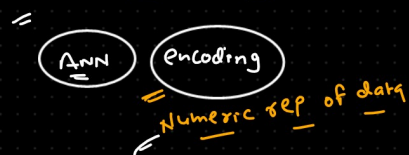


Google stock price

- NLP ⇒
- ① rule based approach (rule based approach)
 - ② ML based ⇒ name based
 - ③ DL based ⇒ RNN

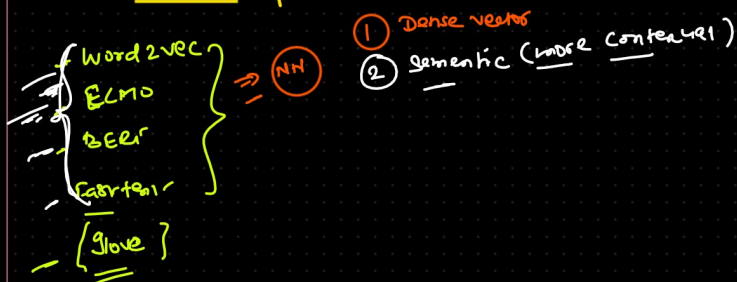
Sequence data

- In today's match indra will score 300

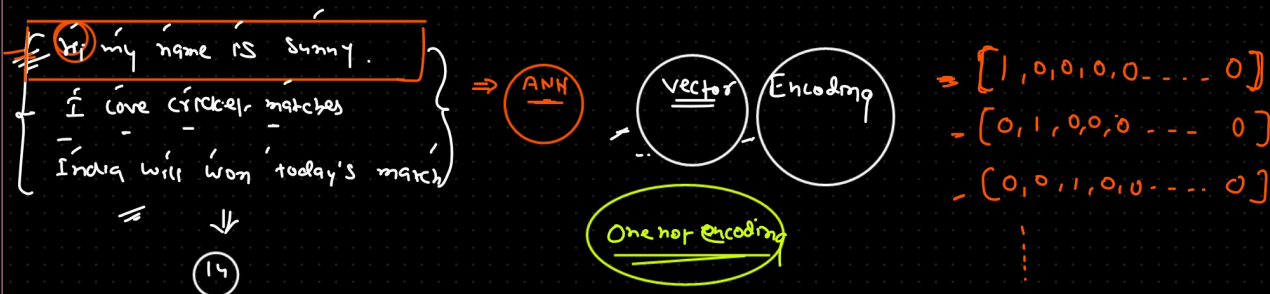


- 1 Document mat.
 - 2 TF-IDF
 - 3 OHE
 - 4 Integer Encoding
- (Sparse matrix)
more zero len no.
{ info. won't be semantic }

Word embedding



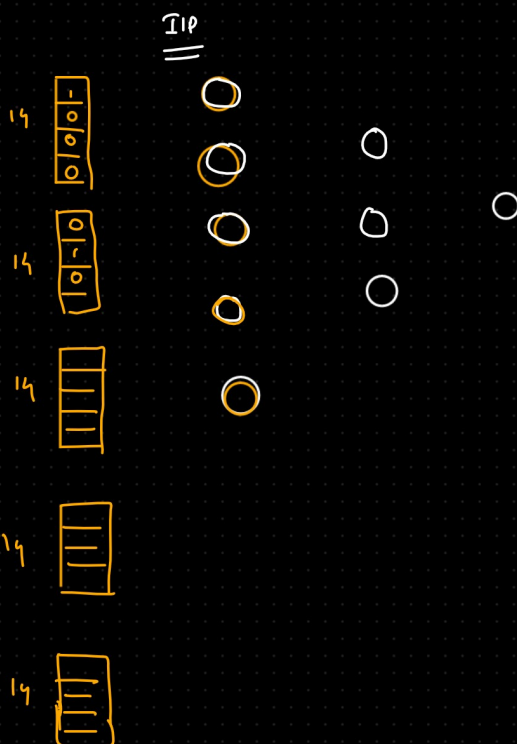
Why ELMO is useful and why ANN ^{not}



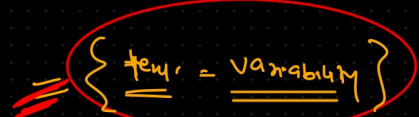
$[h_i, m, name, \dots, match]$
 \downarrow
 $\Rightarrow [1, 0, 0, 0, 0, 0, \dots, 0]$
 $- [0, 1, 0, 0, 0, 0, \dots, 0]$

$5 \times 14 = 70$

$5 \times 14 = 70$



$4 \times 14 = 56$



Sentence

Sanction

Padding

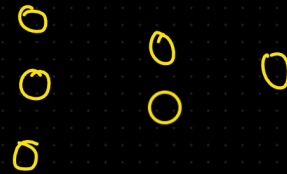
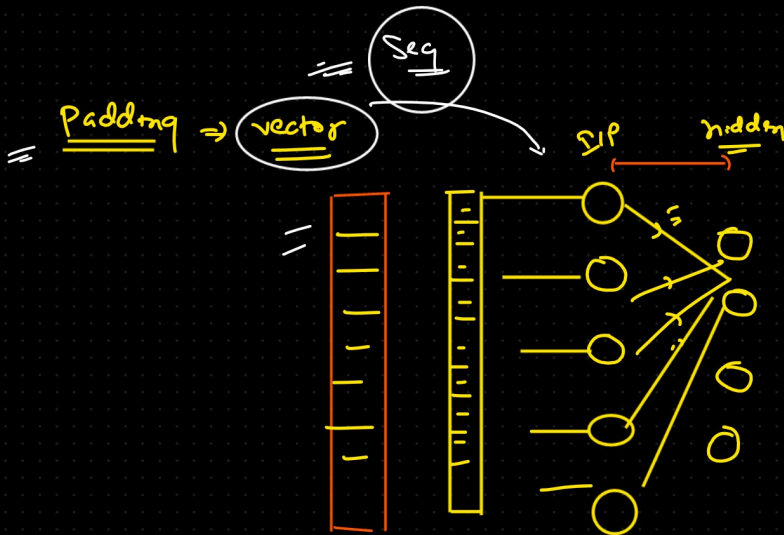


15 words

$15 \times 5000 = 75000$

Padding

Computational expensive



Why not ANN for the text?

1. text input \rightarrow varying the size
2. Padding \rightarrow computational expensive
3. not able to preserve sequence
4. Prediction Problem

training

Prediction

5K ?

RNN \Rightarrow ANN

- Problems RNN
1. Simple RNN (RNN, GRU)
 2. Problems (exploding, vanishing)
 3. LSTM, GRU

4. Deep RNN / Stacked RNN
 5. Bidirectional RNN
- One to many
many to one
many to many

