Sequential Data

22 October 2022 13:09

ANN → tabular data ⟷ CNN → images

RNN → Recurrent NN
↳ is type of sequential model to work on sequential data

iq | marks | gender | placement

placement → does not matter

iq, marks, gender → No

eg → text → sequential data

Hi my name is Nitish

Time series → sequential

RNN → NLP → ML, RNN

CNN → images → computer vision

Speech → sequential

DNA sequence

RNN
- ANN/CNN
- RNN Why?
- Application → RNN
- Roadmap

Why use RNN?

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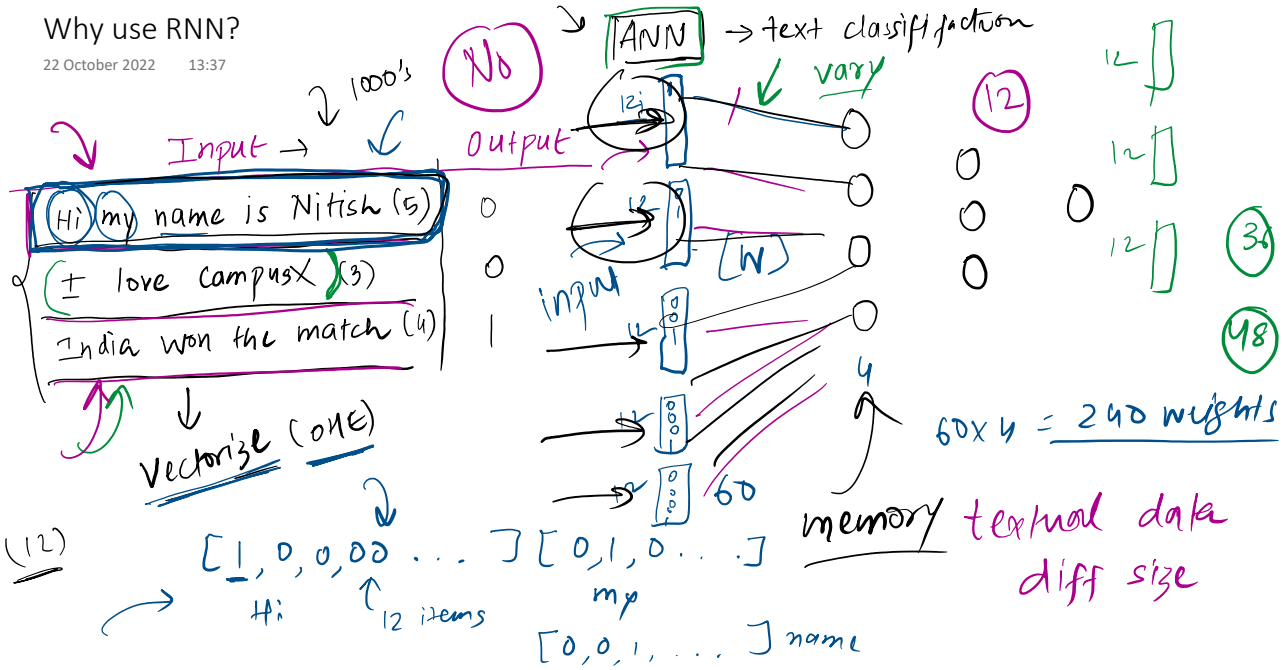
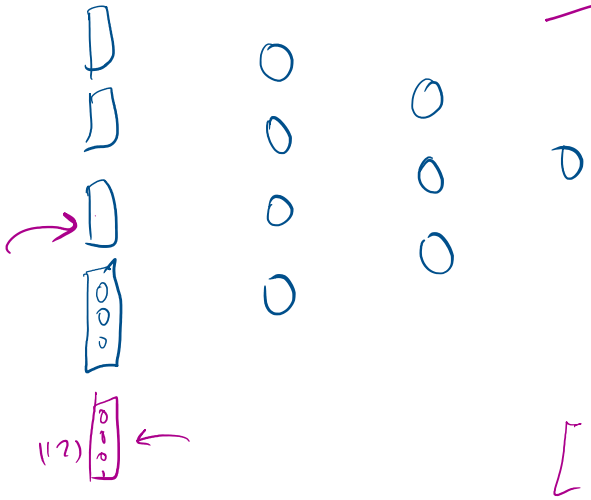


zero padding

varying



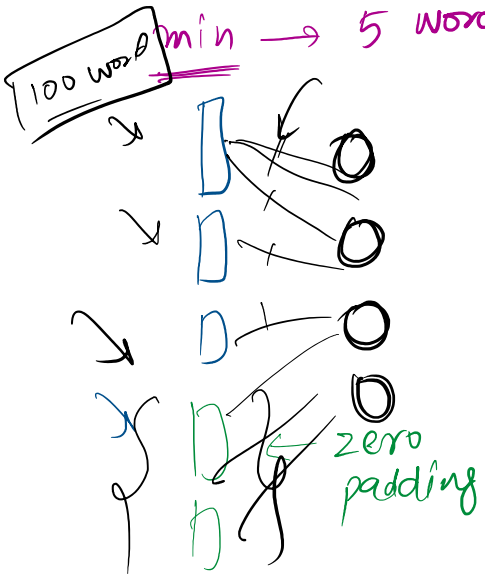
Vocab → 10000 words

10k numbers

max word

100 words

10000 numbs



10000 x 100

10000000

unneccessary computation

fail

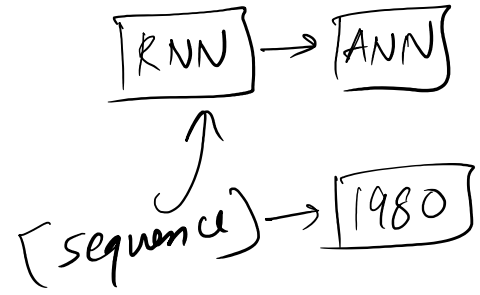
predidin

↓

200 words

→ text input → varying size

1) text input → varying size
2) zero padding → unnecessary computation
3) Prediction problem
4) Totally disregarding the sequence info



If we use ANN , then problems :
1. Text input is of varying size (like each sentence has diff length).
2. If use padding , then unnessary compututions.
3. If we have to predict 200 words then?.
4. Most imp , it losses the sequence info , like their relative order.

Roadmap

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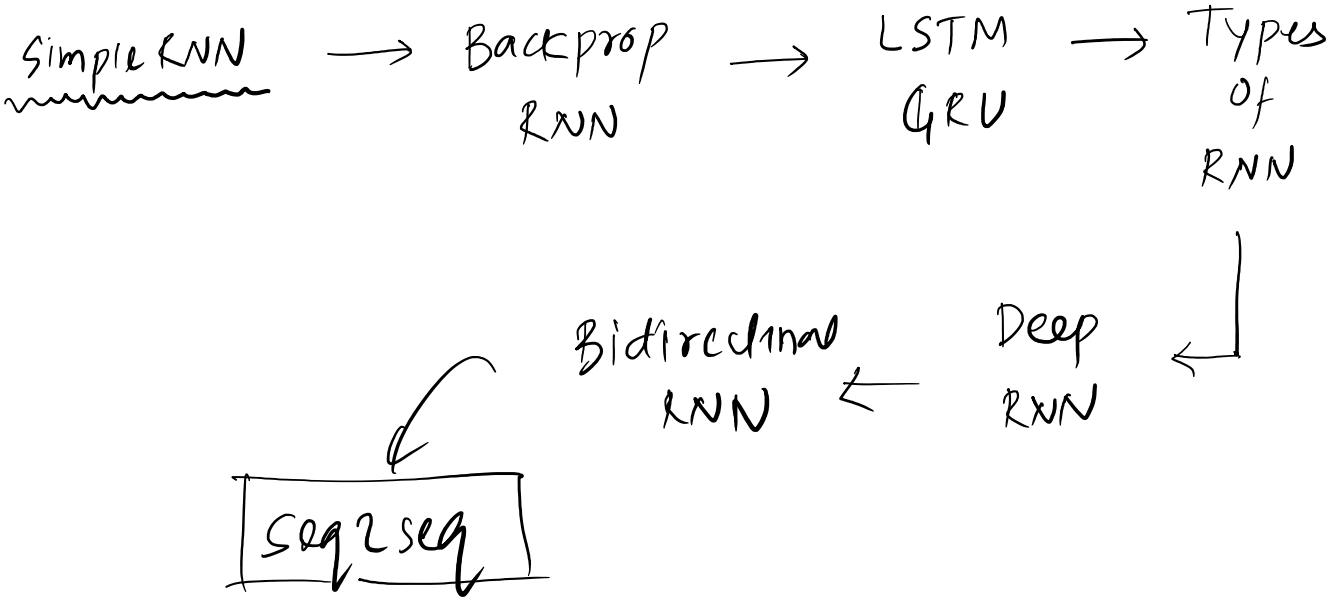

Why RNNs?

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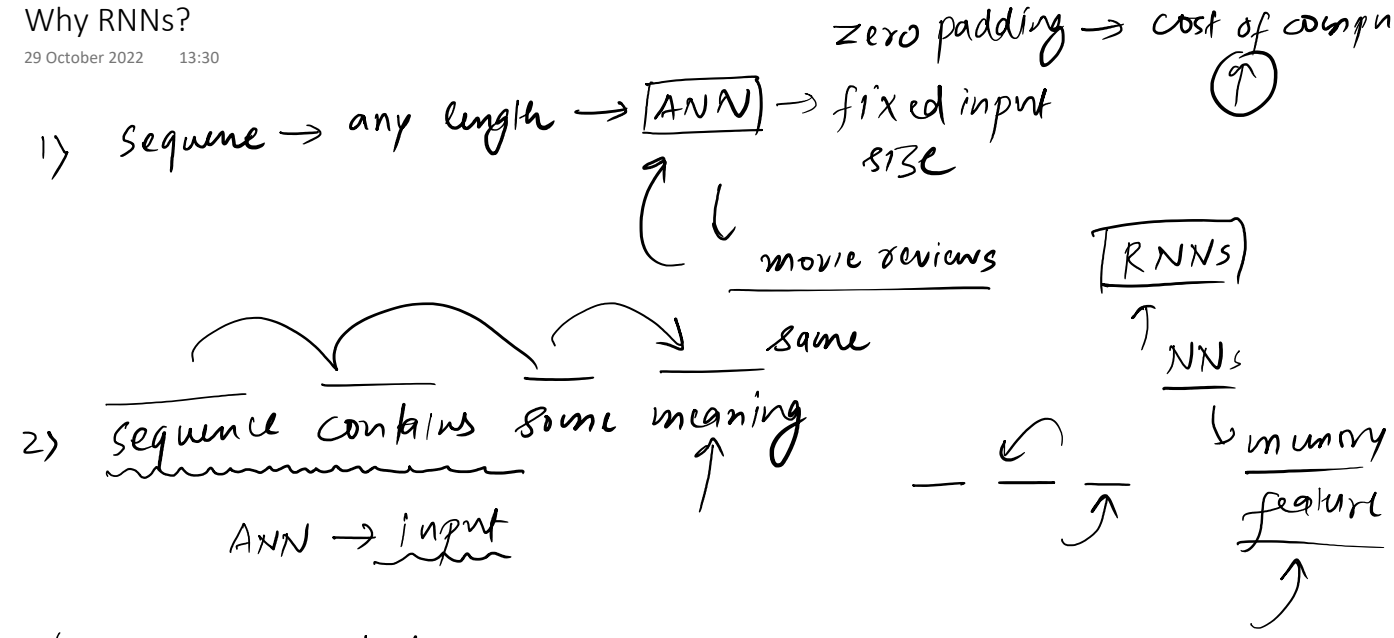

1. In RNN , sequence of varying length is not an issue , as there is step by step processing , so if we choose a single maxlen , then also same no of parameters(weights) whereas in ANN it increase a lot lead to high computation cost.
2. As there is step by step processing and due to its architecture it allows a memory kind of feature to have sequence info.

Data for RNN

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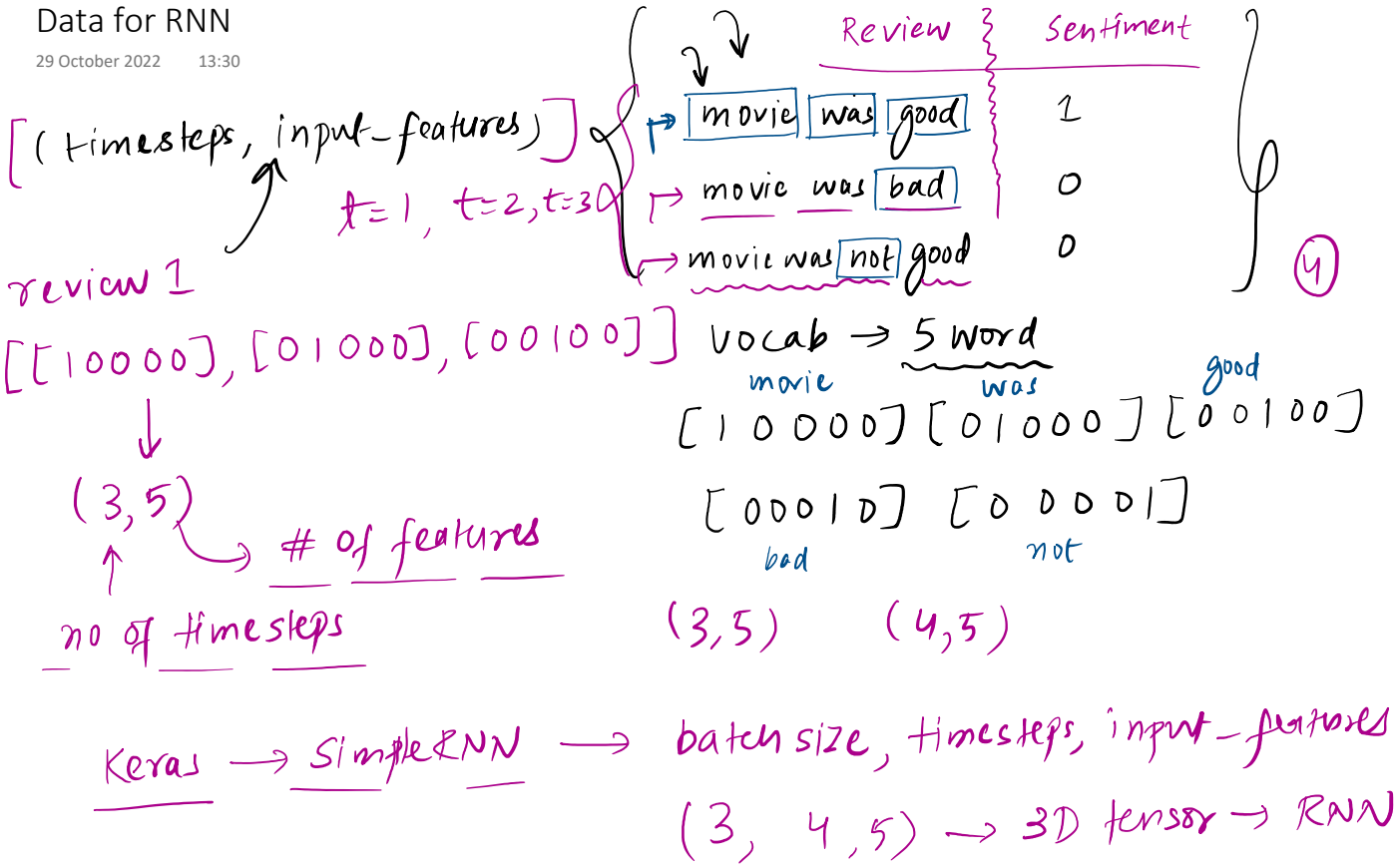

Data is send as (time steps , input_features) , where input feature is like how each word is represented.