
NLP : Recurrent Neural Network
Video 3: Types of RNN
Analytics Vidhya

Types of RNN

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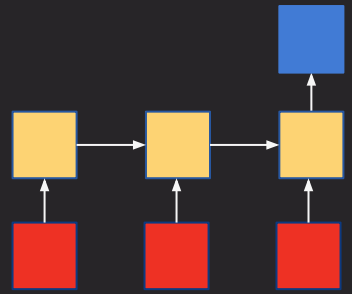
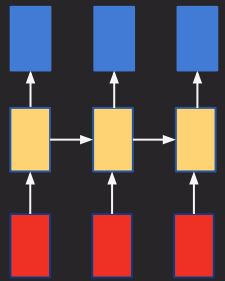
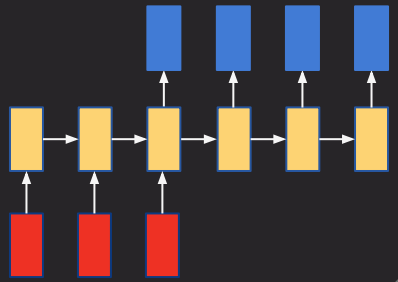
Many to One



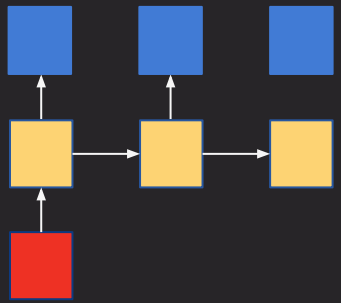
Many to Many



Many to Many



One to Many



One to One

Output at each time step

Hidden Layers

Vectorized Input

Types of RNN

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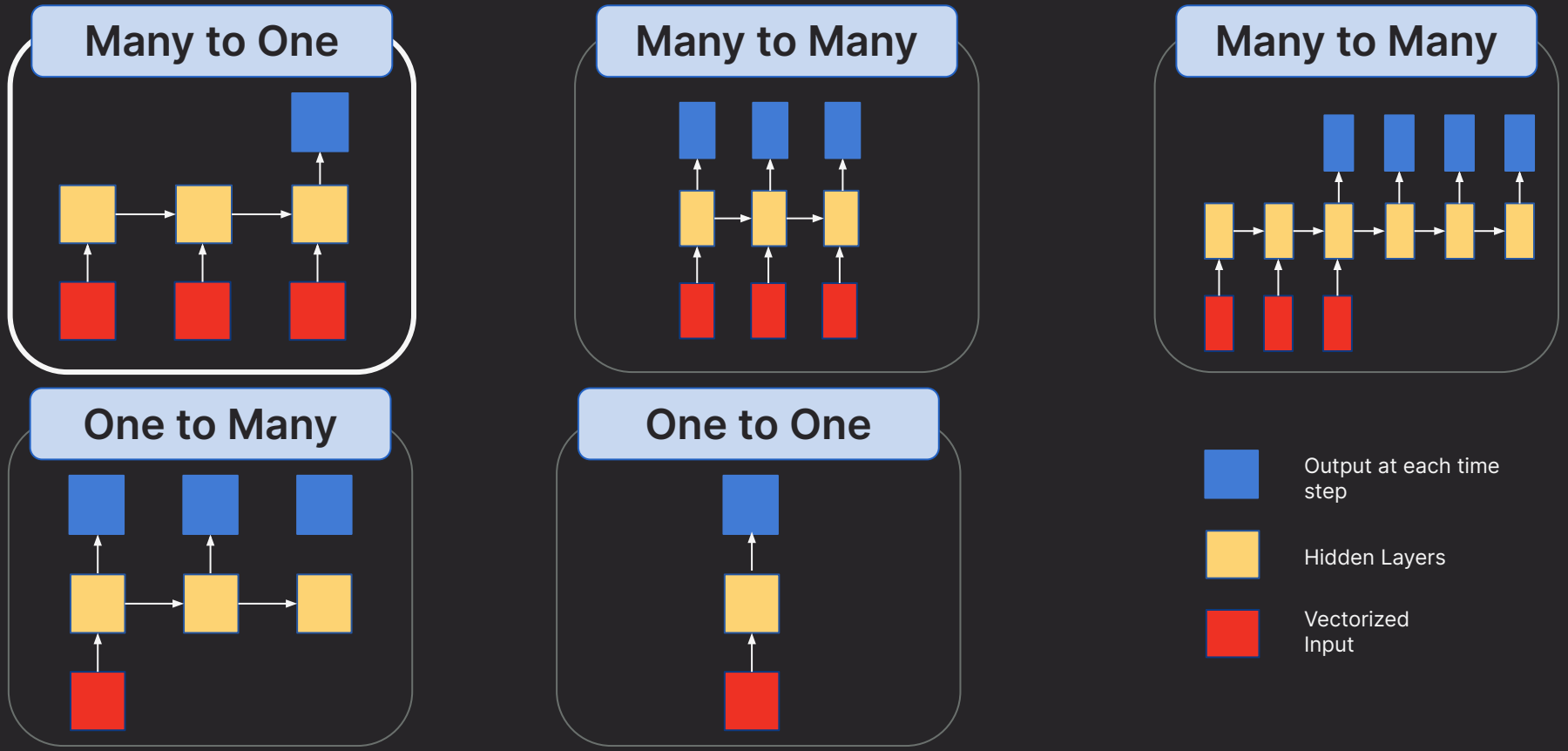
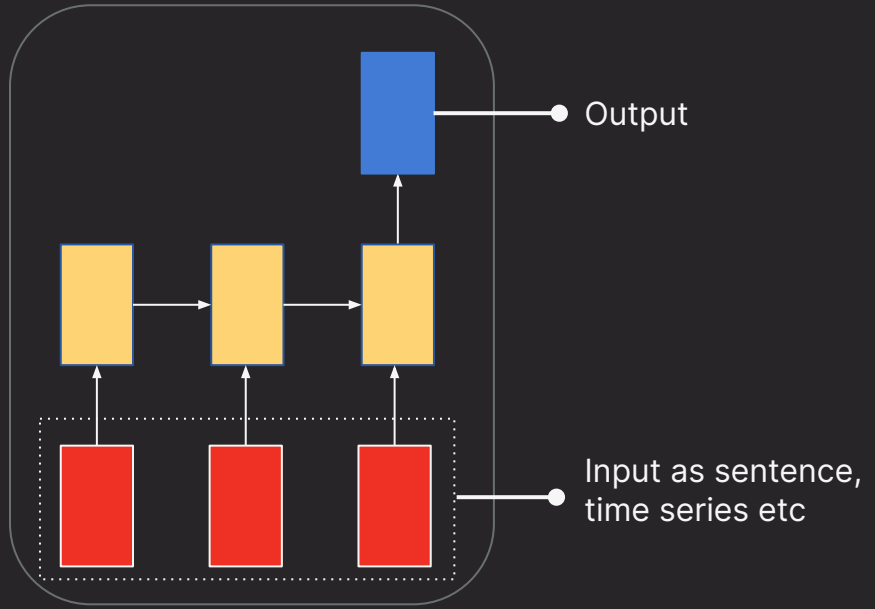
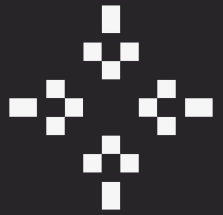


1. Many to One



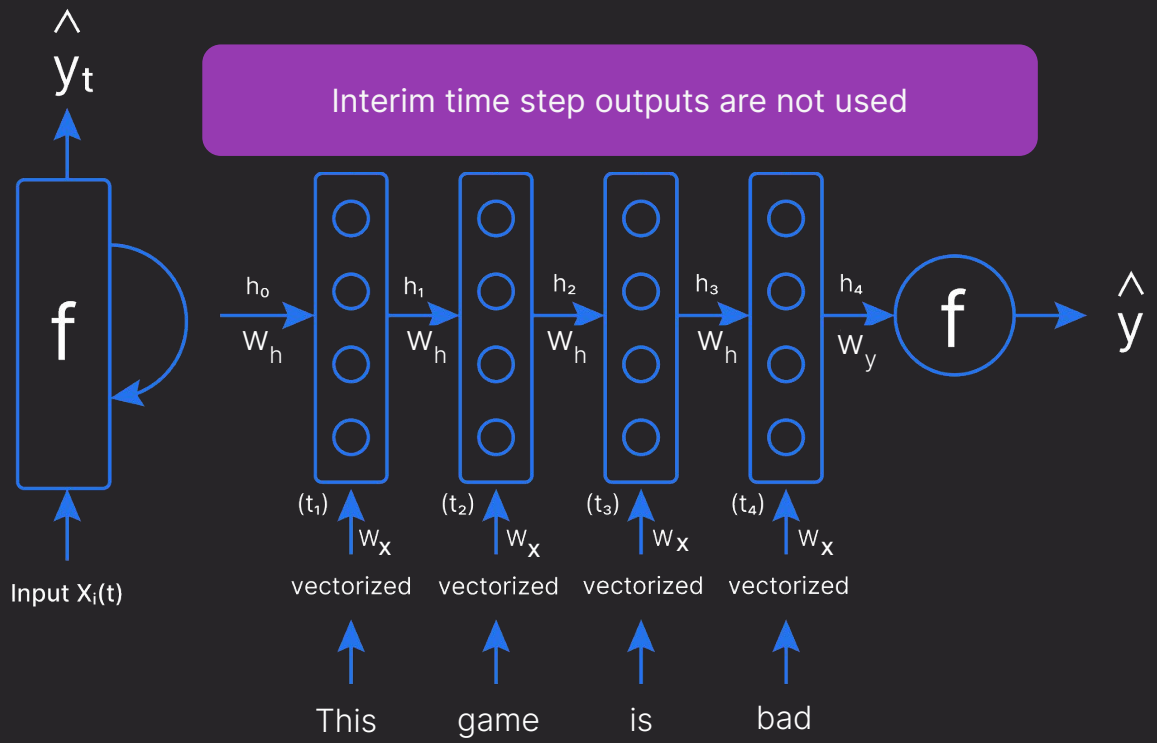
- Expects sequential data in input and non sequential data in output.

For example:



Pixel Games

1. Many to One


ŷt
Interim time step outputs are not used
f
h0
Wh
h1
Wh
h2
Wh
h3
Wh
h4
Wy
f
ŷ
(t1)
(t2)
(t3)
(t4)
Wx
Wx
Wx
Wx
vectorized
vectorized
vectorized
vectorized
Input Xi(t)
This
game
is
bad

Types of RNN

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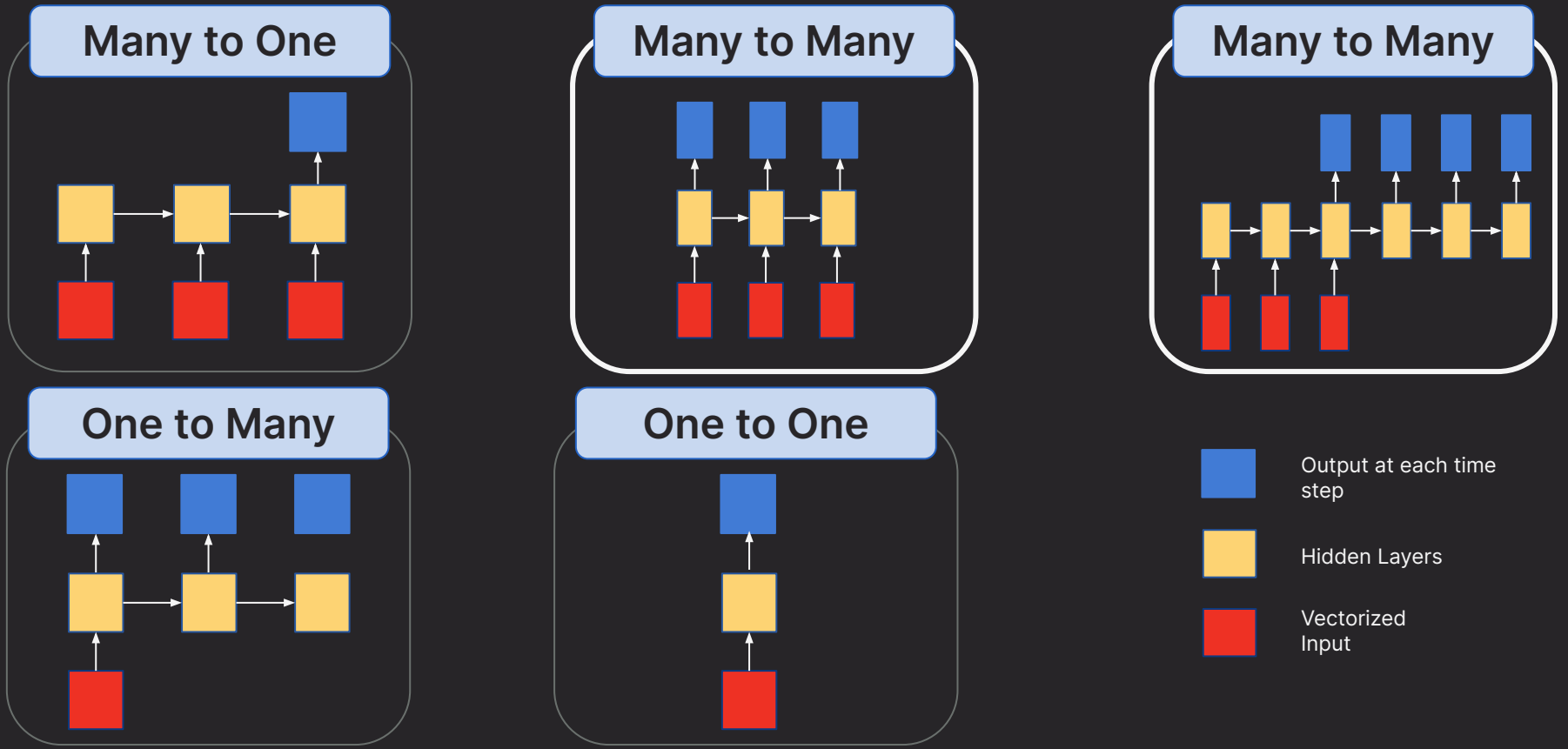

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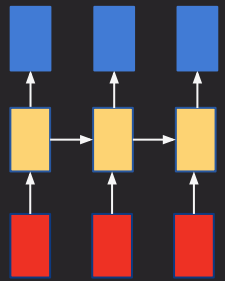
Types of Many-to many RNN

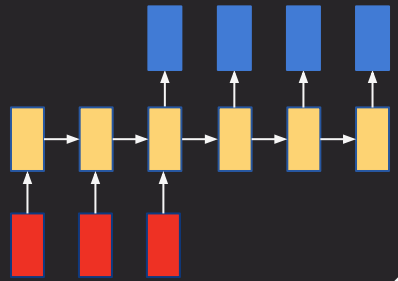
Many to Many



1 Input sequence = Output sequence

Input sequence ≠ Output sequence 2

Many to Many



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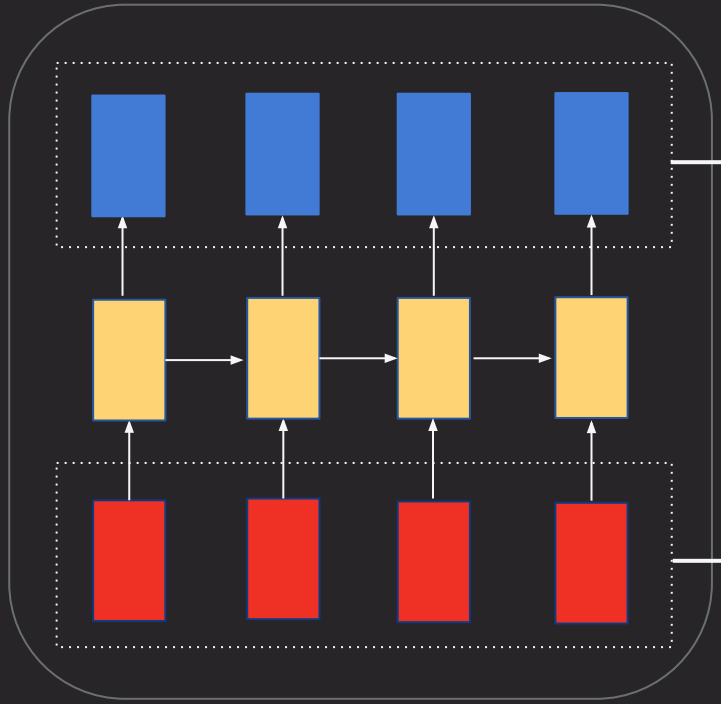
1 Input sequence = Output sequence



For example: Part-of-Speech Tagging

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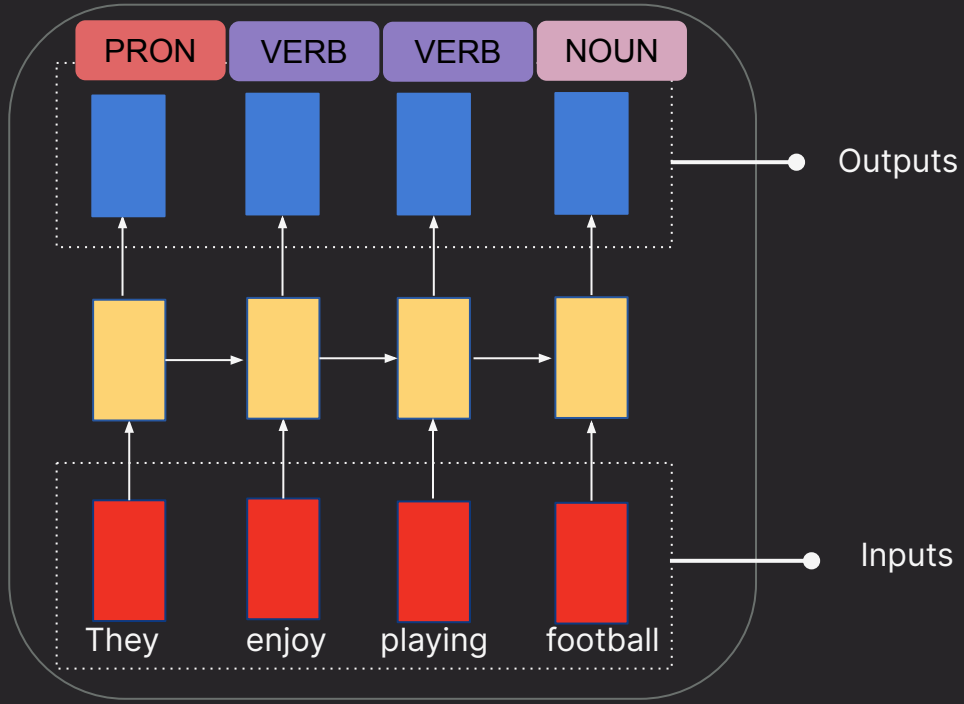
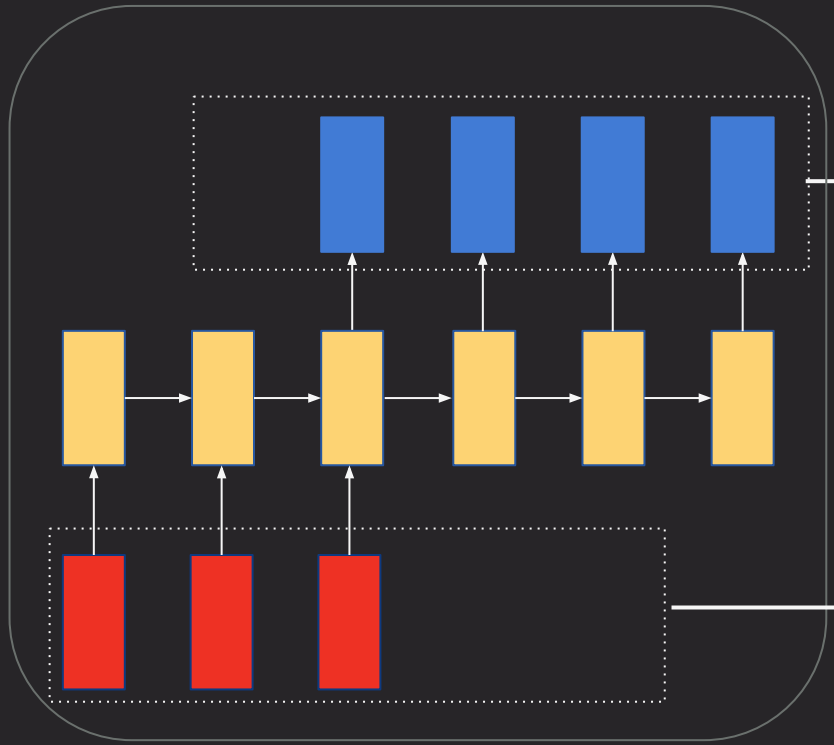
1 Input sequence = Output sequence



2 Input sequence ≠ Output sequence



For example: Machine Translation

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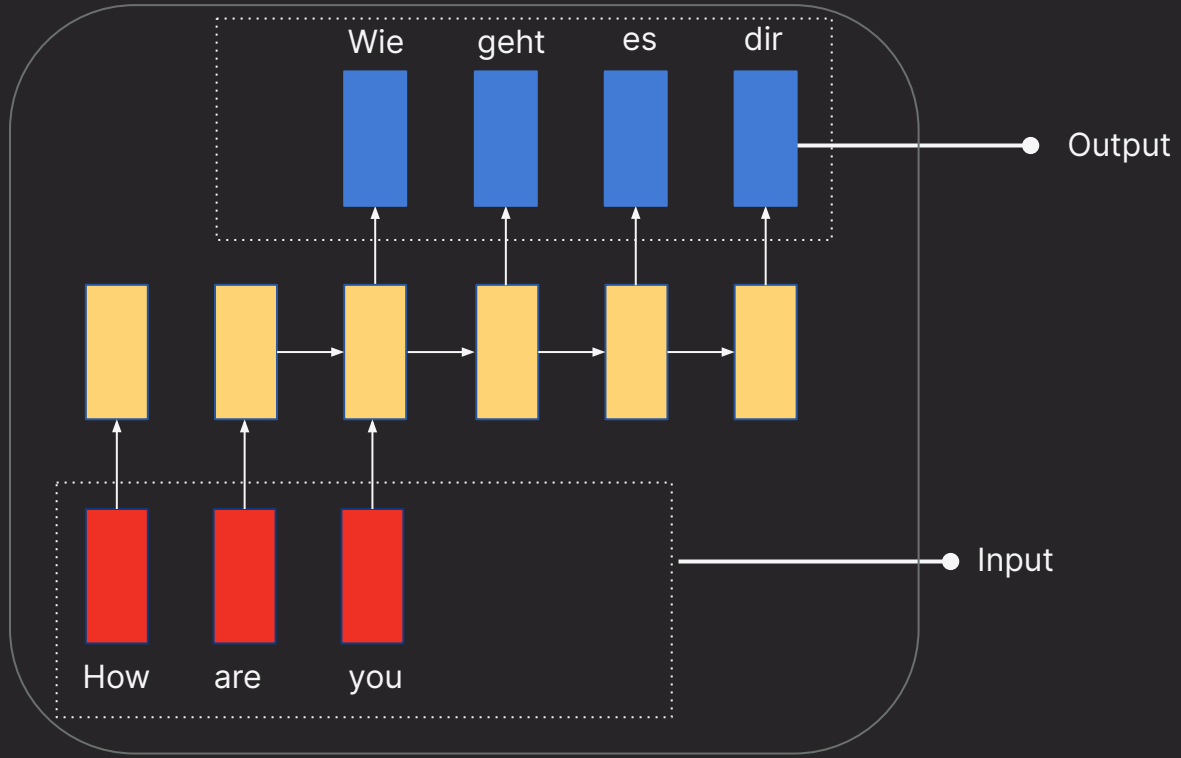
2 Input sequence ≠ Output sequence



Types of RNN

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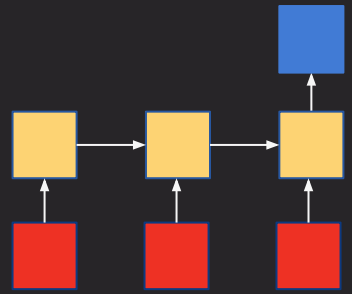
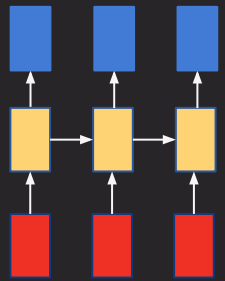
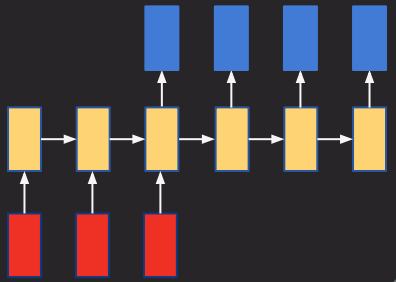
Many to One



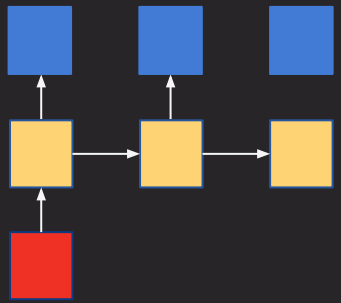
Many to Many



Many to Many



One to Many



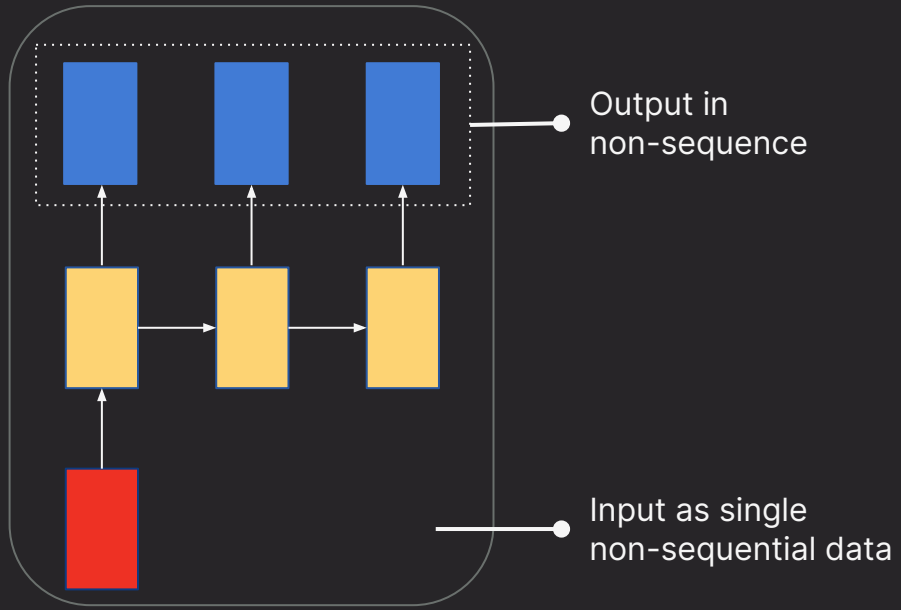
One to One

Output at each time step

Hidden Layers

Vectorized Input

3. One to Many



- Expects non sequential data in input and sequential data in output.

For example:

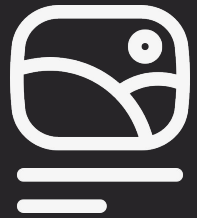
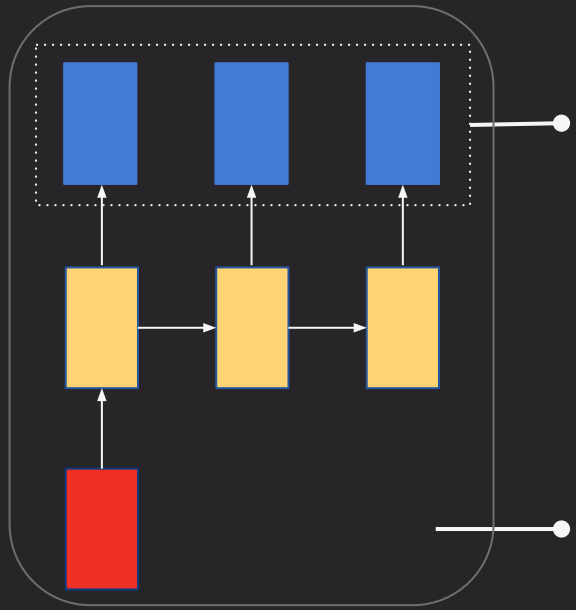


Image Captioning

3. One to Many



- Expects non sequential data in input and sequential data in output.

For example:

Music Generation

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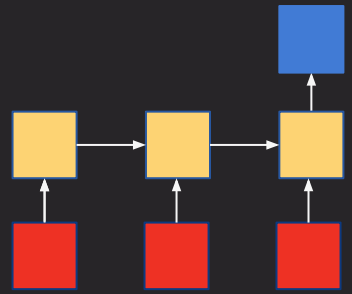
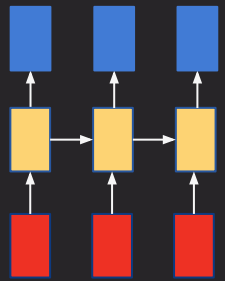
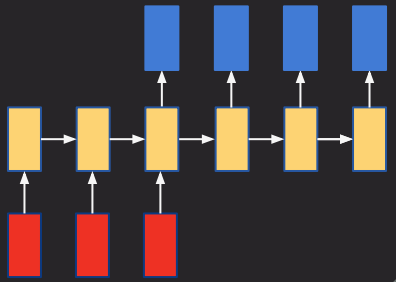
Many to One



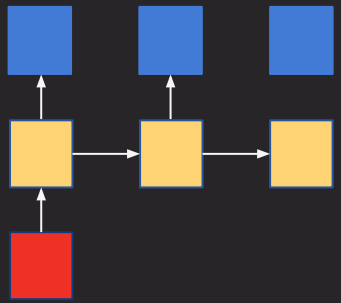
Many to Many



Many to Many



One to Many



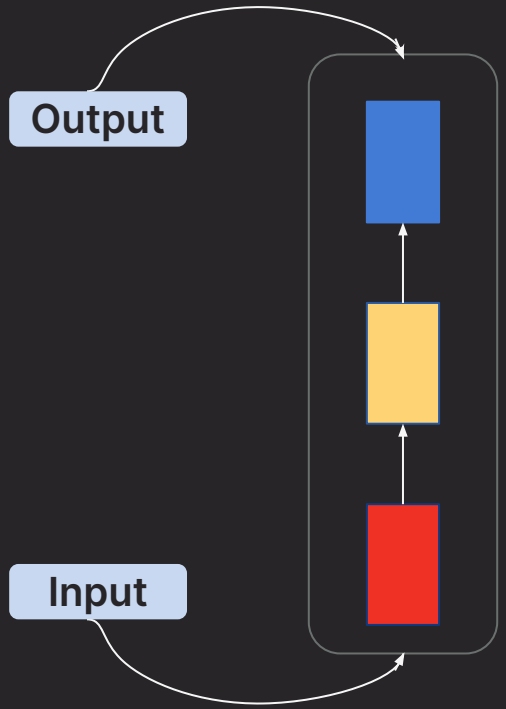
One to One

Output at each time step

Hidden Layers

Vectorized Input

4. One to One



- Expects non sequential data in both input and output.

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Thank you