Recurrent Neural Networks

deeplearning.ai

Different types of RNNs

Examples of sequence data

T_x T_y

x y

Speech recognition
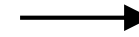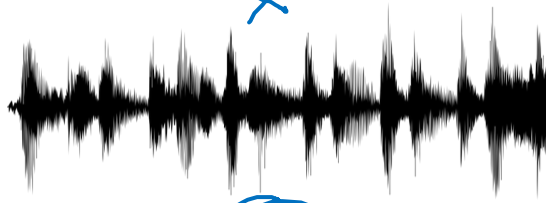
 → "The quick brown fox jumped over the lazy dog."

Music generation

∅ →
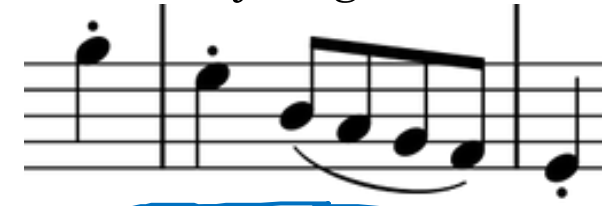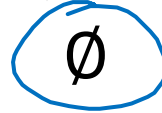
Sentiment classification

"There is nothing to like in this movie." → ★☆☆☆☆

DNA sequence analysis

AGCCCCTGTGAGGAACTAG → AG**CCCCTGTGAGGAACT**AG

Machine translation

Voulez-vous chanter avec moi? → Do you want to sing with me?

Video activity recognition
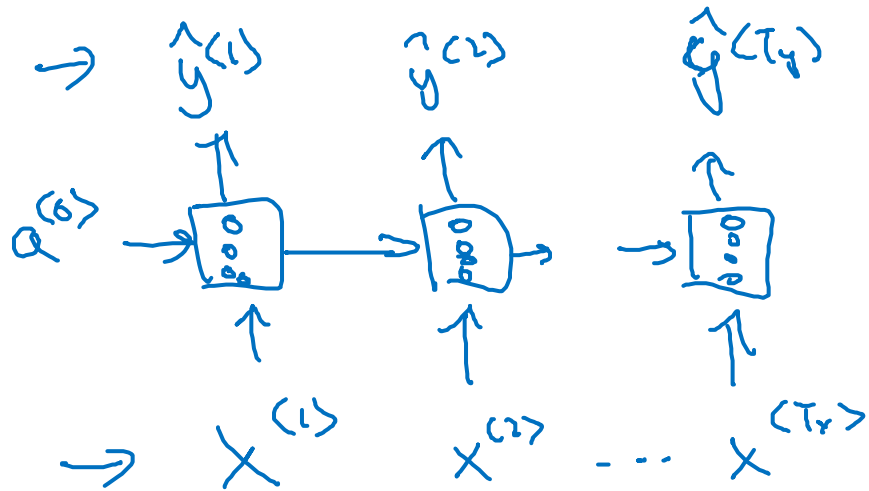
 → Running

Name entity recognition

Yesterday, Harry Potter met Hermione Granger. → Yesterday, **Harry Potter** met **Hermione Granger**.
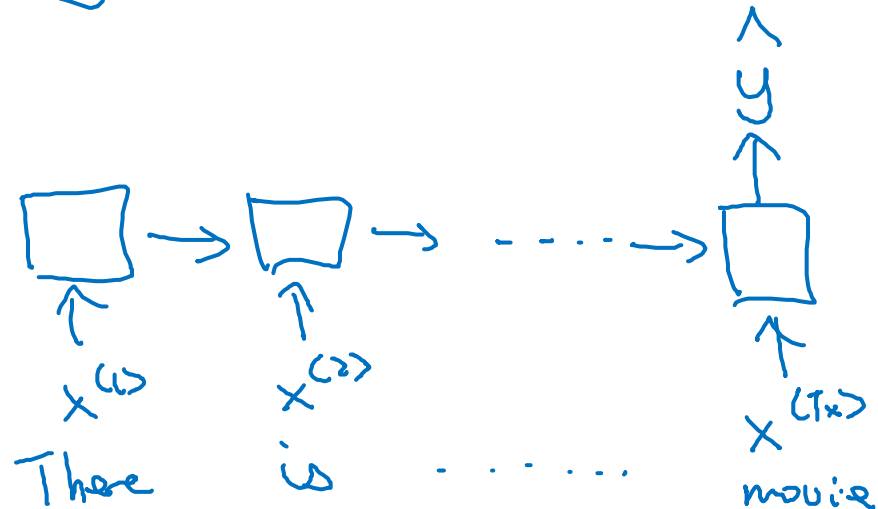
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Examples of RNN architectures

$T_x = T_y$

Sentiment classification
$x = text$
$y = 0/1$ $1 \cdots 5$

Many-to-many

There   is   . . . . . .   movie
$x^{(1)}$ $x^{(2)}$ $x^{(T_x)}$
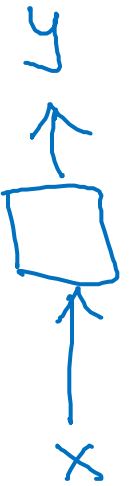
Many-to-one

one-to-one

Examples of RNN architectures

Music generation

$x \rightarrow y^{<1>} y^{<2>} \dots y^{<T_y>}$

One-to-many

$x = \phi$

Machine translation

encoder

decoder

Many-to-many

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Summary of RNN types

$\hat{y}^{<1>}$

$a^{<0>} \to$

$x^{<1>}$

One to one

$\hat{y}^{<1>}$ $\hat{y}^{<2>}$ $\hat{y}^{<T_y>}$

$a^{<0>} \to$

x $\cdots$

One to many

$\hat{y}$

$a^{<0>} \to$

$x^{<1>}$ $x^{<2>}$ $x^{<T_x>}$

Many to one

$\hat{y}^{<1>}$ $\hat{y}^{<2>}$ $\hat{y}^{<T_y>}$

$a^{<0>} \to$

$x^{<1>}$ $x^{<2>}$ $x^{<T_x>}$

Many to many $T_x = T_y$

$\hat{y}^{<1>}$ $\hat{y}^{<T_y>}$

$a^{<0>} \to$

$x^{<1>}$ $x^{<T_x>}$

Many to many

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