



deeplearning.ai

# Recurrent Neural Networks

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## Notation

# Motivating example

NLP

x: Harry Potter and Hermione Granger invented a new spell.

$\rightarrow x^{(1)} \quad x^{(2)} \quad x^{(3)} \quad \dots \quad x^{(t)} \quad \dots \quad x^{(9)}$

$$T_x = 9$$

$\rightarrow y:$

$y^{(1)} \quad y^{(2)} \quad y^{(3)} \quad \dots \quad y^{(9)}$

$$T_y = 9$$

$x^{(i)(t)}$

$$T_x^{(i)} = 9$$

15

$y^{(i)(t)}$   
 $\uparrow$

$$T_y^{(i)}$$

# Representing words

$x^{(t)}$

$(x, y)$

$x \rightarrow y$

x: Harry Potter and Hermione Granger invented a new spell.

$x^{(1)}$

$x^{(2)}$

$x^{(3)}$

...

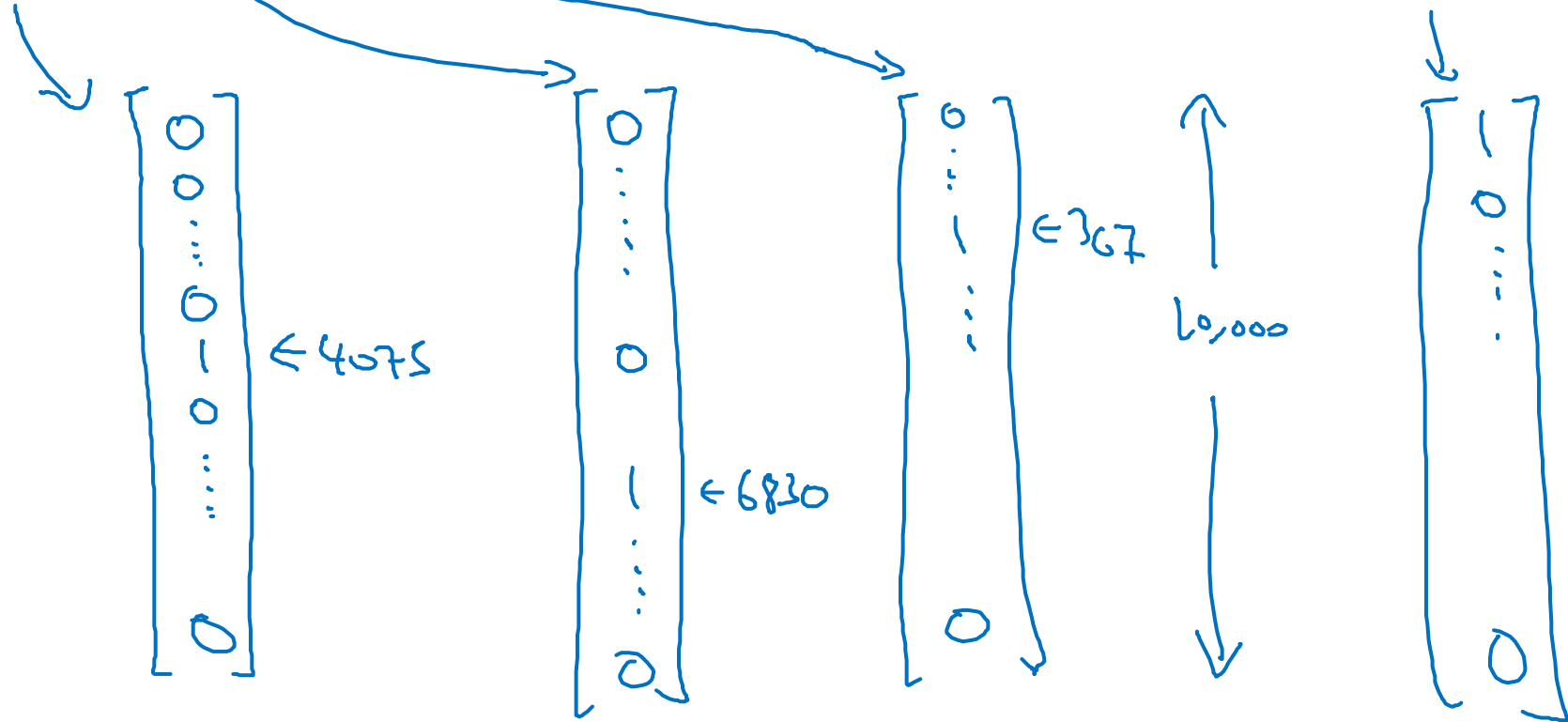
$x^{(7)}$

$x^{(9)}$

Vocabulary

a	1
aaron	2
...	...
and	367
...	...
harry	4075
...	...
potter	6830
...	...
zulu	10,000

<UNK>    10,000



One-hot

# Representing words

x: Harry Potter and Hermione Granger invented a new spell.

$$x^{<1>} \quad x^{<2>} \quad x^{<3>} \quad \dots \quad x^{<9>}$$

And = 367

Invented = 4700

$A = 1$

New = 5976

Spell = 8376

Harry = 4075

Potter = 6830

Hermione = 4200

Gran... = 4000