



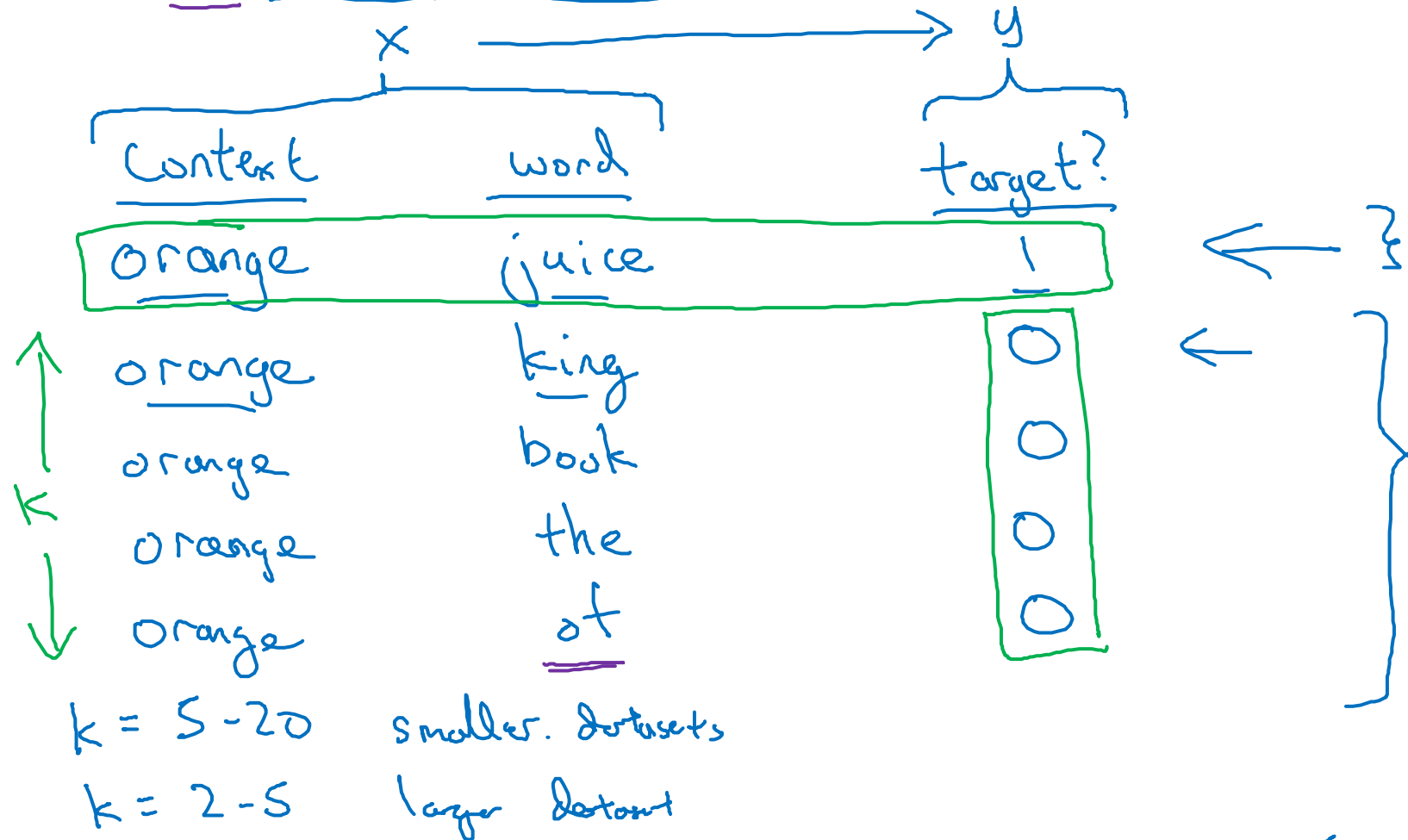
deeplearning.ai

NLP and Word Embeddings

Negative sampling

Defining a new learning problem

I want a glass of orange juice to go along with my cereal.



Model

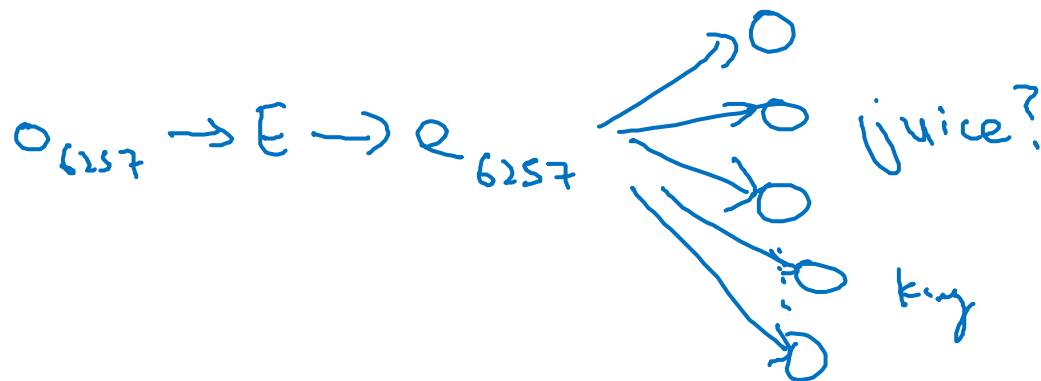
Softmax:

$$p(t|c) = \frac{e^{\theta_t^T e_c}}{\sum_{j=1}^{10,000} e^{\theta_j^T e_c}} \quad \left. \vphantom{\sum_{j=1}^{10,000}} \right\} \begin{array}{l} \text{10,000-way} \\ \text{softmax} \end{array}$$

$$P(y=1 | c, t) = \sigma(\theta_t^T e_c) \leftarrow$$

x		y
context	word	target?
orange	juice	1
orange	king	0
orange	book	0
orange	the	0
orange	of	0
c	t	y

Orange
6257



10,000
10,000 binary
classification
problem
k+1

Selecting negative examples

<u>context</u>	<u>word</u>	<u>target?</u>
orange	juice	1
orange	king	0
orange	book	0
orange	the	0
orange	of	0

↑
t

the, of, and, ...

$$P(w_i) = \frac{f(w_i)^{3/4}}{\sum_{j=1}^{10,000} f(w_j)^{3/4}}$$

$$\frac{1}{|V|}$$

↑