网易云课堂

NLP and Word Embeddings

deeplearning.ai

Negative sampling

Defining a new learning problem

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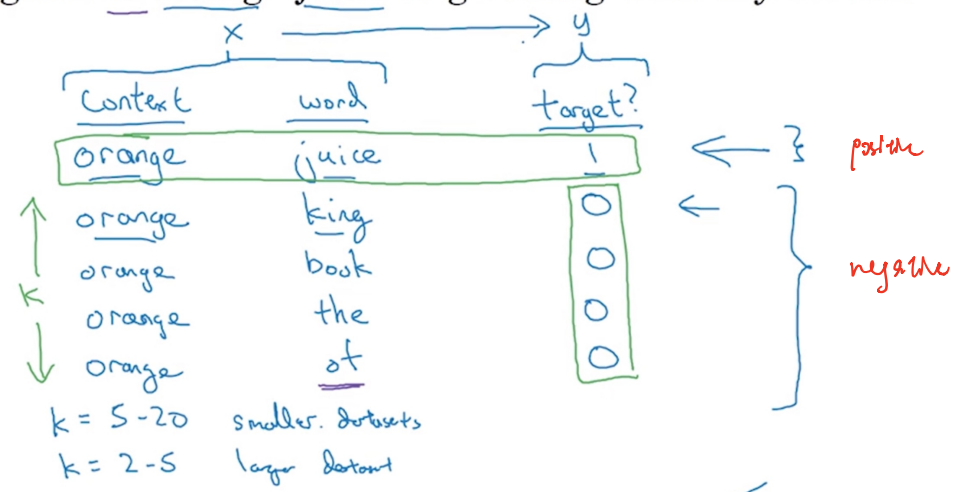
I want a glass of orange juice to go along with my cereal.



[Mikolov et. al., 2013. Distributed representation of words and phrases and their compositionality]

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Model

Softmax: $p(t|c) = \frac{e^{\theta_t^T e_c}}{\sum_{j=1}^{10,000} e^{\theta_j^T e_c}}$ — 10,000-way softmax

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

context	word	target?
orange	juice	1
orange	king	0
orange	book	0
orange	the	0
orange	of	0

(k)

c, t, y

Orange 6257

$o_{6257} \rightarrow E \rightarrow e_{6257}$

juice? king ... 10,000

10,000 binary classification problem

k+1

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Selecting negative examples

context	word	target?
orange	juice	1
orange	king	0
orange	book	0
orange	the	0
orange	of	0

the, of, and, ...

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

Andrew Ng