



deeplearning.ai

NLP and Word Embeddings

Word2Vec

Skip-grams

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



Context

orange

orange

orange



Target

juice

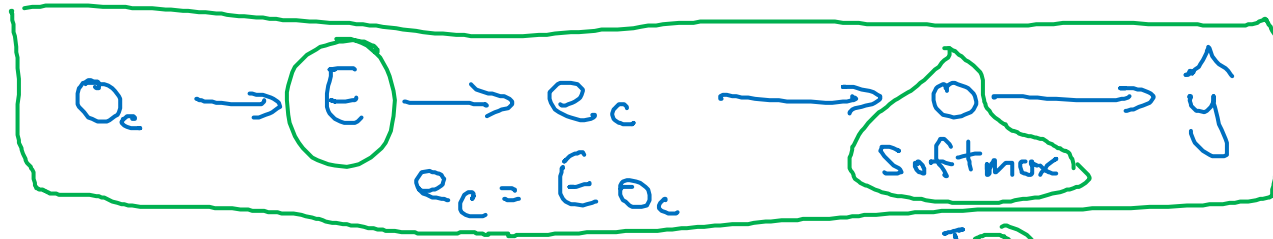
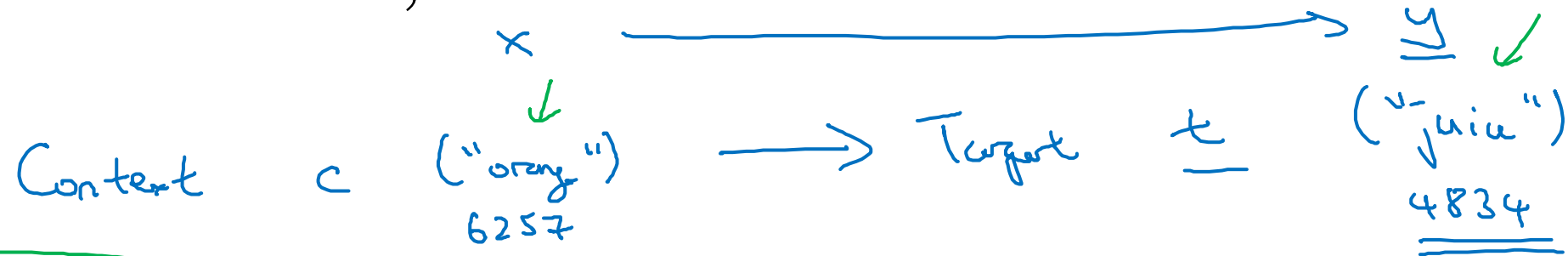
glass

my



Model

Vocab size = 10,000k



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

θ_t = parameter associated with output t

Loss function (Cross-Entropy Loss):

$$\mathcal{L}(\hat{y}, y) = - \sum_{i=1}^{10,000} y_i \log \hat{y}_i$$

Output vector y (one-hot vector):

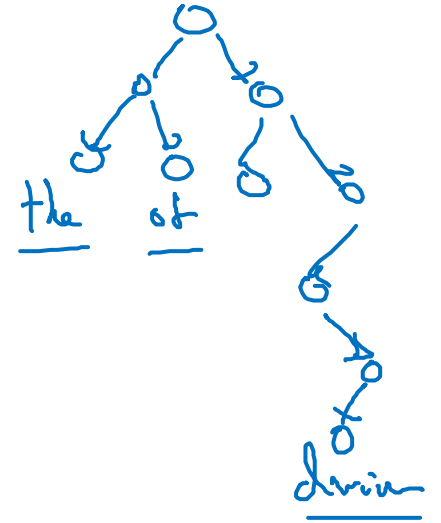
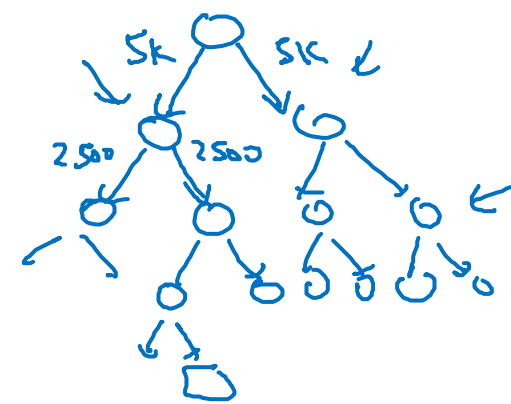
$$y = \begin{bmatrix} 0 \\ \vdots \\ 1 \\ \vdots \\ 0 \end{bmatrix} \leftarrow 4834$$

Problems with softmax classification

$$\underline{p(t|c)} = \frac{e^{\theta_t^T \underline{e_c}}}{\sum_{j=1}^{10,000} e^{\theta_j^T e_c}}$$

Hierarchical softmax.

$\log |V|$



How to sample the context c ?

→ the, of, a, and, to, ...

→ orange, apple, durian

P_{durian}

t

$c \rightarrow t$

$P(c)$