Natural Language Processing & Word Embeddings

10/10 points (100%)

Quiz, 10 questions

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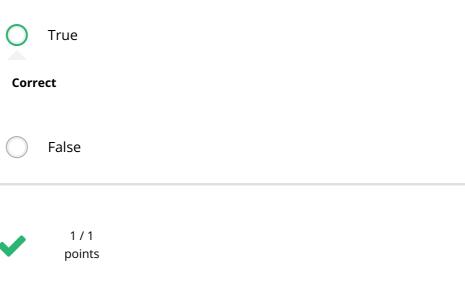
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Suppose you download a pre-trained word embedding which has been trained on a huge corpus of text. You then use this word embedding to train an RNN for a language task of recognizing if someone is happy from a short snippet of text, using a small training set.

x (input text)	y (happy?)
I'm feeling wonderful today!	1
I'm bummed my cat is ill.	0
Really enjoying this!	1

Then even if the word "ecstatic" does not appear in your small training set, your RNN might reasonably be expected to recognize "I'm ecstatic" as deserving a label y=1.



4

Which of these equations do you think should hold for a good word embedding? (Check all that apply)

$$igcup_{boy} - e_{girl} pprox e_{brother} - e_{sister}$$

Correct

$$e_{boy} - e_{girl} pprox e_{sister} - e_{brother}$$

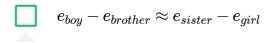
Un-selected is correct

e_{bou} $-$	$e_{brother}$	$pprox e_{airl}$	$-e_{sistes}$
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Un-selected is correct



1/1 points

5.

Let E be an embedding matrix, and let e_{1234} be a one-hot vector corresponding to word 1234. Then to get the embedding of word 1234, why don't we call $E*e_{1234}$ in Python?



It is computationally wasteful.

Correct

The correct formula is E^{T}	$*e_{1234}$

This doesn't handle unknown words (<UNK>).

None of the above: Calling the Python snippet as described above is fine.



1/1 points

6.

When learning word embeddings, we create an artificial task of estimating $P(target \mid context)$. It is okay if we do poorly on this artificial prediction task; the more important by-product of this task is that we learn a useful set of word embeddings.



True

Correct

False

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1/1 points

7.

In the word2vec algorithm, you estimate $P(t \mid c)$, where t is the target word and c is a context word. How are t and c chosen from the training set? Pick the best answer.

- igcap c is a sequence of several words immediately before t.
- c is the one word that comes immediately before t.
- igcup c and t are chosen to be nearby words.

Correct

 $\bigcirc \quad c$ is the sequence of all the words in the sentence before t.



1/1 points

8.

Suppose you have a 10000 word vocabulary, and are learning 500-dimensional word embeddings. The word2vec model uses the following softmax function:

$$P(t \mid c) = rac{e^{ heta_t^T e_c}}{\sum_{t'=1}^{10000} e^{ heta_{t'}^T e_c}}$$

Which of these statements are correct? Check all that apply.

 $igcap_t$ and e_c are both 500 dimensional vectors.

Correct

 θ_t and e_c are both 10000 dimensional vectors.

Un-selected is correct

 θ_t and e_c are both trained with an optimization algorithm such as Adam or gradient descent.

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Correct

After training, we should expect $heta_t$ to be very close to e_c when t and c are the same word.

Un-selected is correct



1/1 points

9.

Suppose you have a 10000 word vocabulary, and are learning 500-dimensional word embeddings. The GloVe model minimizes this objective:

$$\min \sum_{i=1}^{10,000} \sum_{j=1}^{10,000} f(X_{ij}) (heta_i^T e_j + b_i + b_j' - log X_{ij})^2$$

Which of these statements are correct? Check all that apply.

 $igcup_i$ and e_j should be initialized to 0 at the beginning of training.

Un-selected is correct

 $\hfill \hfill \theta_i$ and e_j should be initialized randomly at the beginning of training.

Correct

 X_{ij} is the number of times word i appears in the context of word j.

Correct

The weighting function f(.) must satisfy f(0)=0.

Correct

The weighting function helps prevent learning only from extremely common word pairs. It is not necessary that it satisfies

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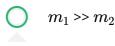
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10.

You have trained word embeddings using a text dataset of m_1 words. You are considering using these word embeddings for a language task, for which you have a separate labeled dataset of m_2 words. Keeping in mind that using word embeddings is a form of transfer learning, under which of these circumstance would you expect the word embeddings to be helpful?



Correct







