

✓ Congratulations! You passed!

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GRADE 100%

Natural Language Processing & Word Embeddings

LATEST SUBMISSION GRADE

-4	0	1	9%	
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1.	Suppose you learn a word embedding for a vocabulary of 10000 words. Then the embedding vectors should be
	10000 dimensional, so as to capture the full range of variation and meaning in those words.

1 / 1 point

_	
()	True

False



The dimension of word vectors is usually smaller than the size of the vocabulary. Most common sizes for word vectors ranges between 50 and 400.

2. What is t-SNE?

- A linear transformation that allows us to solve analogies on word vectors
- A non-linear dimensionality reduction technique
- $\begin{tabular}{ll} \hline \end{tabular} A supervised learning algorithm for learning word embeddings \\ \hline \end{tabular}$
- O An open-source sequence modeling library



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.

1 / 1 point

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.







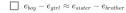
Yes, word vectors empower your model with an incredible ability to generalize. The vector for "ecstatic would contain a positive/happy connotation which will probably make your model classified the sentence as a "1".

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

1 / 1 point

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





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

✓ Correct

5.	Let E be an embedding matrix, and let o_{1234} be a one-hot vector corresponding to word 1234. Then to get the embedding of word 1234, why don't we call $E*o_{1234}$ in Python?	1 / 1 point
	It is computationally wasteful.	
	$igcup$ The correct formula is $E^T * o_{1234}.$	
	This doesn't handle unknown words (<unk>).</unk>	
	None of the above: calling the Python snippet as described above is fine.	
	✓ Correct	
	Yes, the element-wise multiplication will be extremely inefficient.	
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.	1 / 1 point
	● True	
	○ False	
	Correct	
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.	1 / 1 point
	$\bigcirc c$ is a sequence of several words immediately before t .	
	$\bigcirc c$ is the one word that comes immediately before t .	
	\bigcirc c is the sequence of all the words in the sentence before t .	
	lacklacklacklacklacklacklacklack	
	✓ Correct	
8.	Suppose you have a 10000 word vocabulary, and are learning 500-dimensional word embeddings. The word2vec model uses the following softmax function:	1/1 point
	$P(t \mid c) = rac{e^{ heta_t^T \epsilon_c}}{\sum_{t'=0}^{1000} e^{ heta_t^T \epsilon_c}}$	
	Which of these statements are correct? Check all that apply.	
	$ abla$ $ heta_t$ and e_c are both 500 dimensional vectors.	
	✓ Correct	
	$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	
	$artheta$ $ heta_t$ and e_c are both trained with an optimization algorithm such as Adam or gradient descent.	
	✓ Correct	
	$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	
9.	Suppose you have a 10000 word vocabulary, and are learning 500-dimensional word embeddings. The GloVe model minimizes this objective:	1 / 1 point
	$\min \sum_{i=1}^{10,000} \sum_{j=1}^{10,000} f(X_{ij}) (heta_i^T e_j + b_i + b_j$ ' $- log X_{ij})^2$	
	Which of these statements are correct? Check all that apply.	
	$igcup_{ heta}$ and e_j should be initialized to 0 at the beginning of training.	
	$oldsymbol{arphi}$ $ heta_i$ and e_j should be initialized randomly at the beginning of training.	
	✓ Correct	
	$m{ ilde{m{Z}}} X_{ij}$ is the number of times word j appears in the context of word i.	
	✓ Correct	

 \blacksquare $e_{boy} - e_{brother} \approx e_{sister} - e_{girl}$

lacksquare 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 this function.

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?

1/1 point



 $\bigcirc \ m_1 \lessdot \lessdot m_2$

✓ Correct