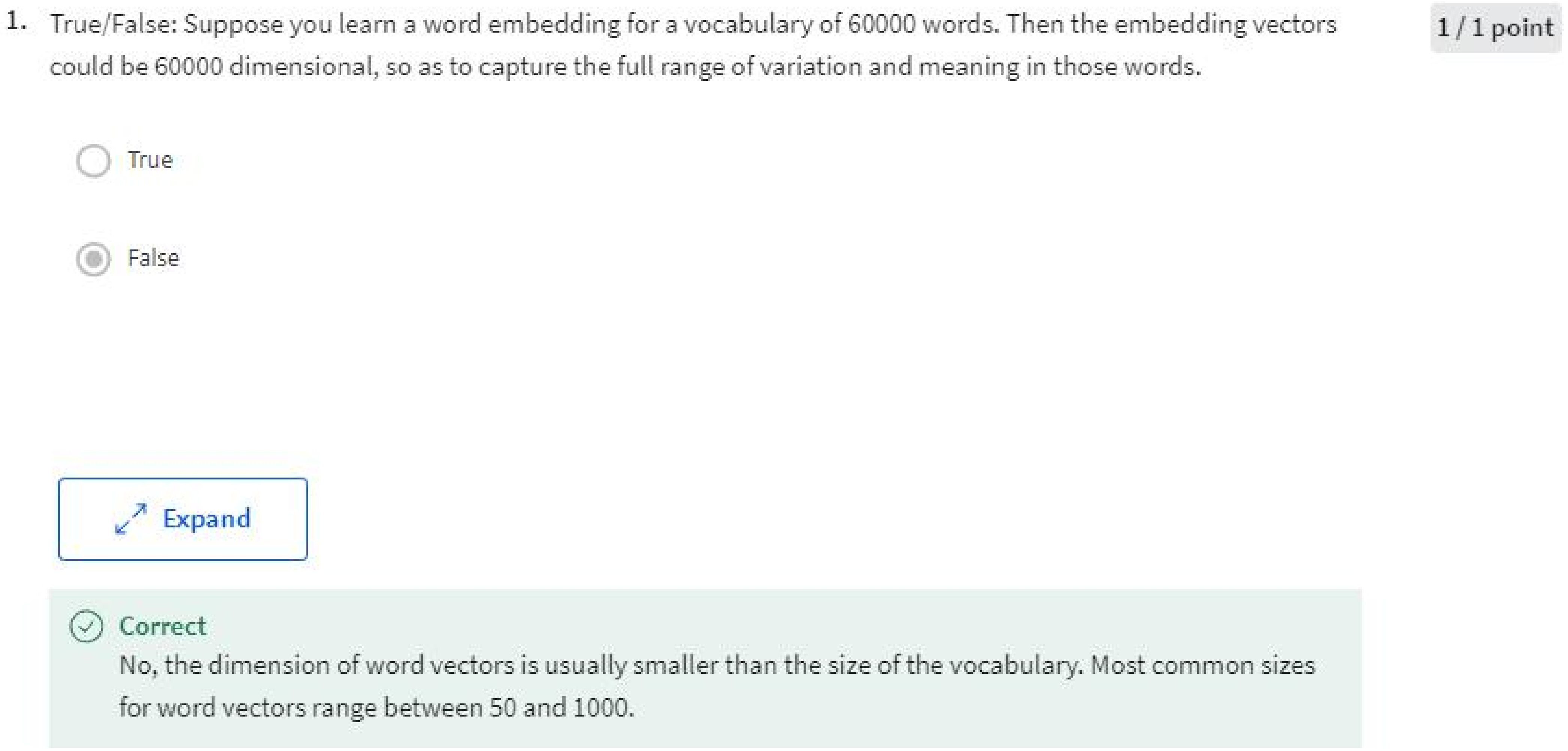


1. True/False: Suppose you learn a word embedding for a vocabulary of 60000 words. Then the embedding vectors could be 60000 dimensional, so as to capture the full range of variation and meaning in those words.

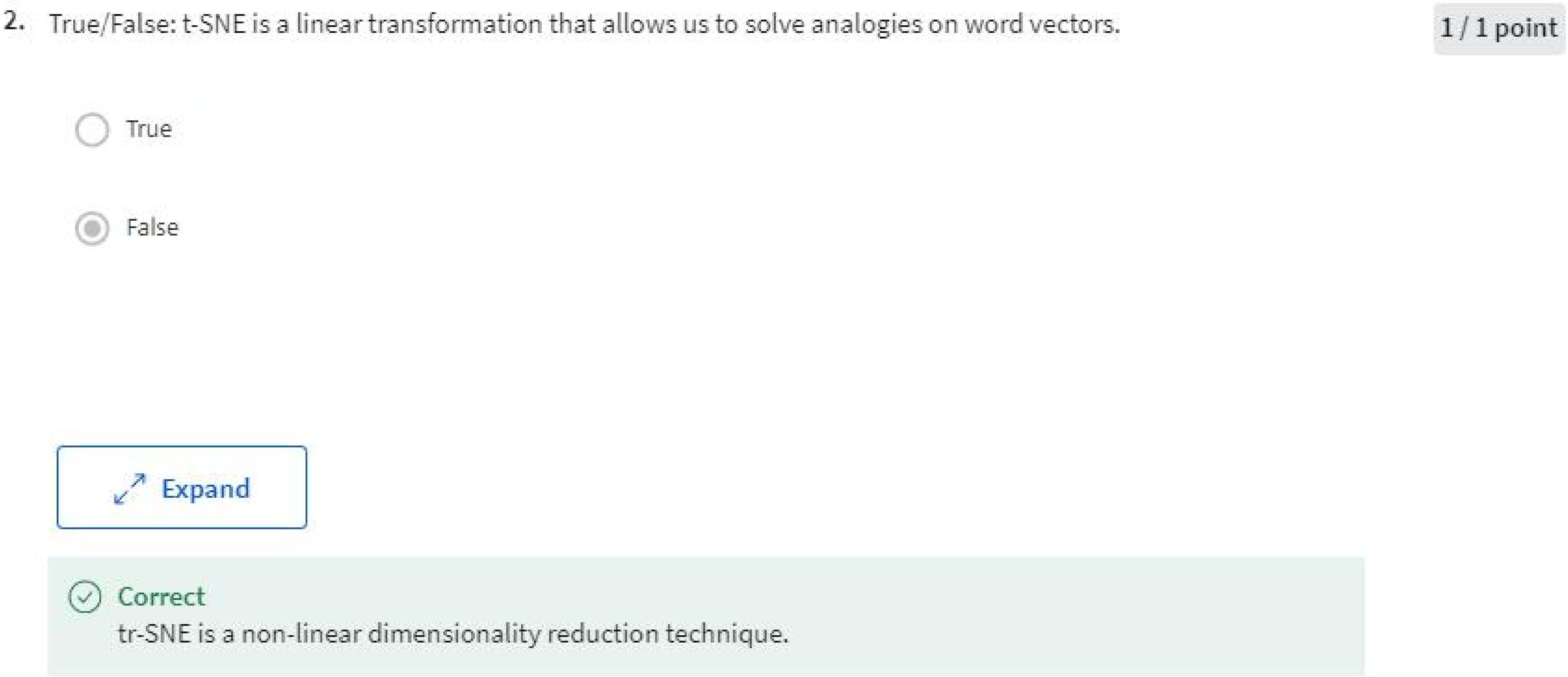
1 / 1 point

○ True

● False

Correct

No, the dimension of word vectors is usually smaller than the size of the vocabulary. Most common sizes for word vectors range between 50 and 1000.



2. True/False: t-SNE is a linear transformation that allows us to solve analogies on word vectors.

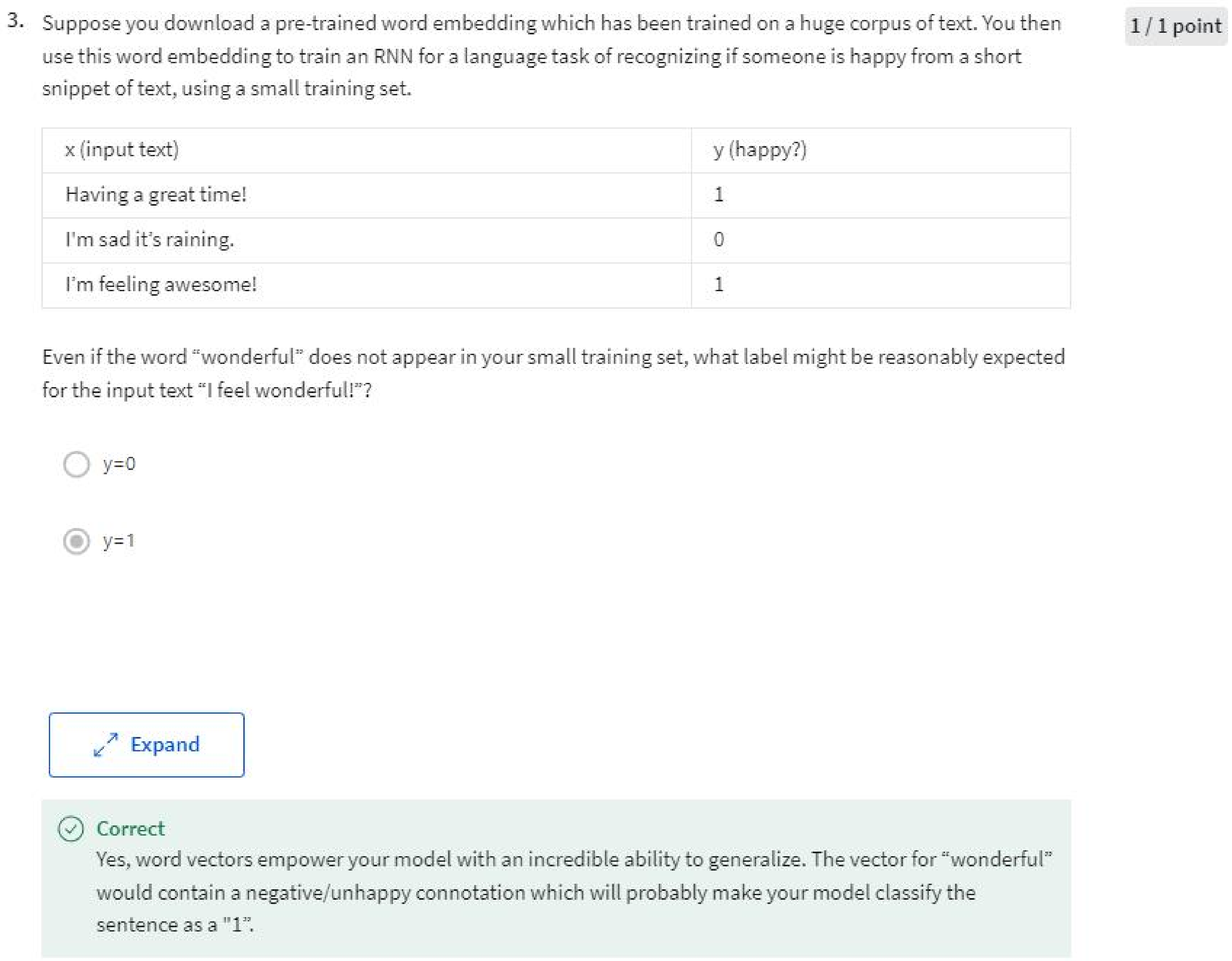
1 / 1 point

○ True

● False

Correct

tr-SNE is a non-linear dimensionality reduction technique.



3. 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?)
Having a great time!	1
I'm sad it's raining.	0
I'm feeling awesome!	1

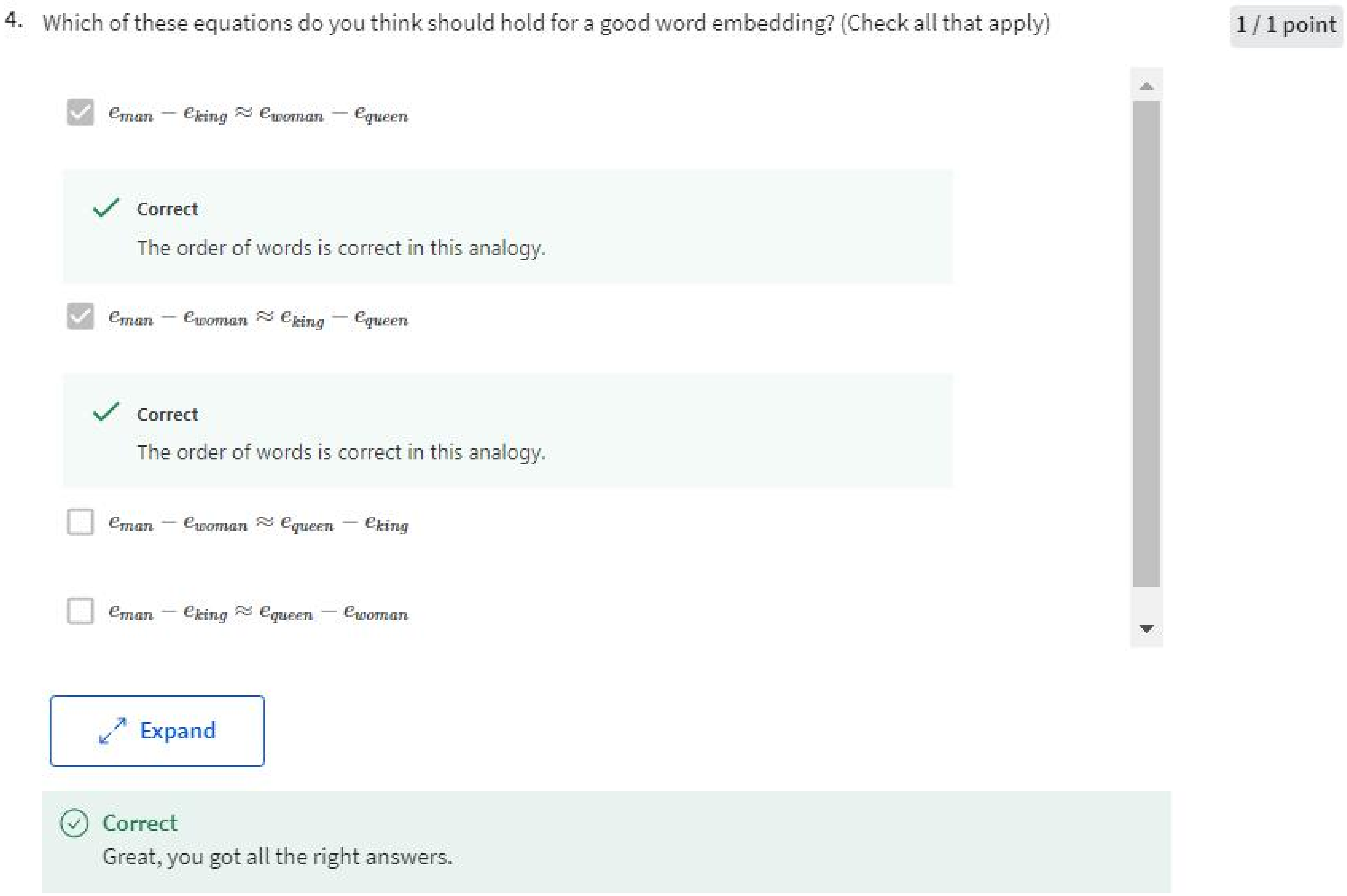
Even if the word "wonderful" does not appear in your small training set, what label might be reasonably expected for the input text "I feel wonderful!"?

○ y=0

● y=1

✓ Correct

Yes, word vectors empower your model with an incredible ability to generalize. The vector for "wonderful" would contain a negative/unhappy connotation which will probably make your model classify 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

☑ $e_{man} - e_{king} \approx e_{woman} - e_{queen}$

✓ Correct

The order of words is correct in this analogy.

☑ $e_{man} - e_{woman} \approx e_{king} - e_{queen}$

✓ Correct

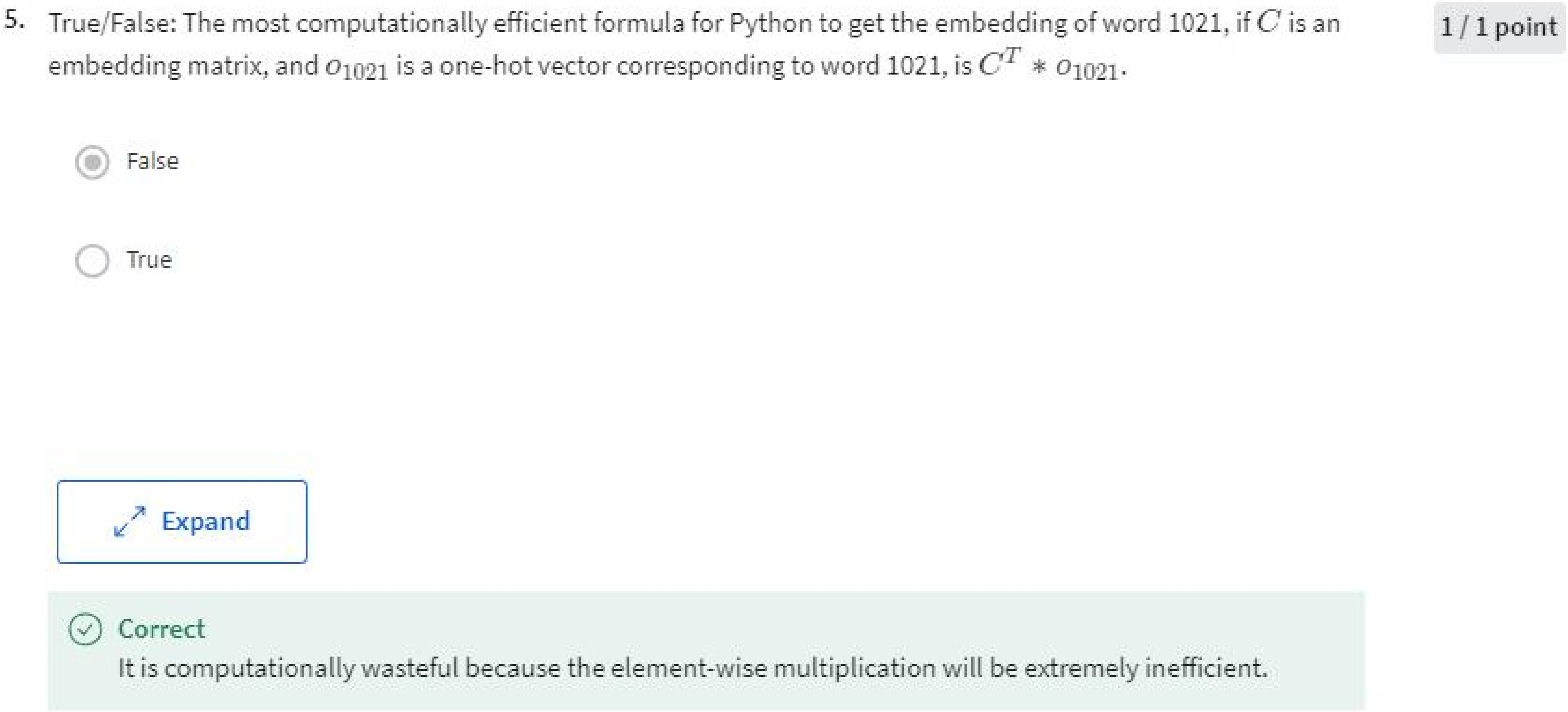
The order of words is correct in this analogy.

□ $e_{man} - e_{woman} \approx e_{queen} - e_{king}$

□ $e_{man} - e_{king} \approx e_{queen} - e_{woman}$

✓ Correct

Great, you got all the right answers.



5. True/False: The most computationally efficient formula for Python to get the embedding of word 1021, if C is an embedding matrix, and o_{1021} is a one-hot vector corresponding to word 1021, is $C^T * o_{1021}$.

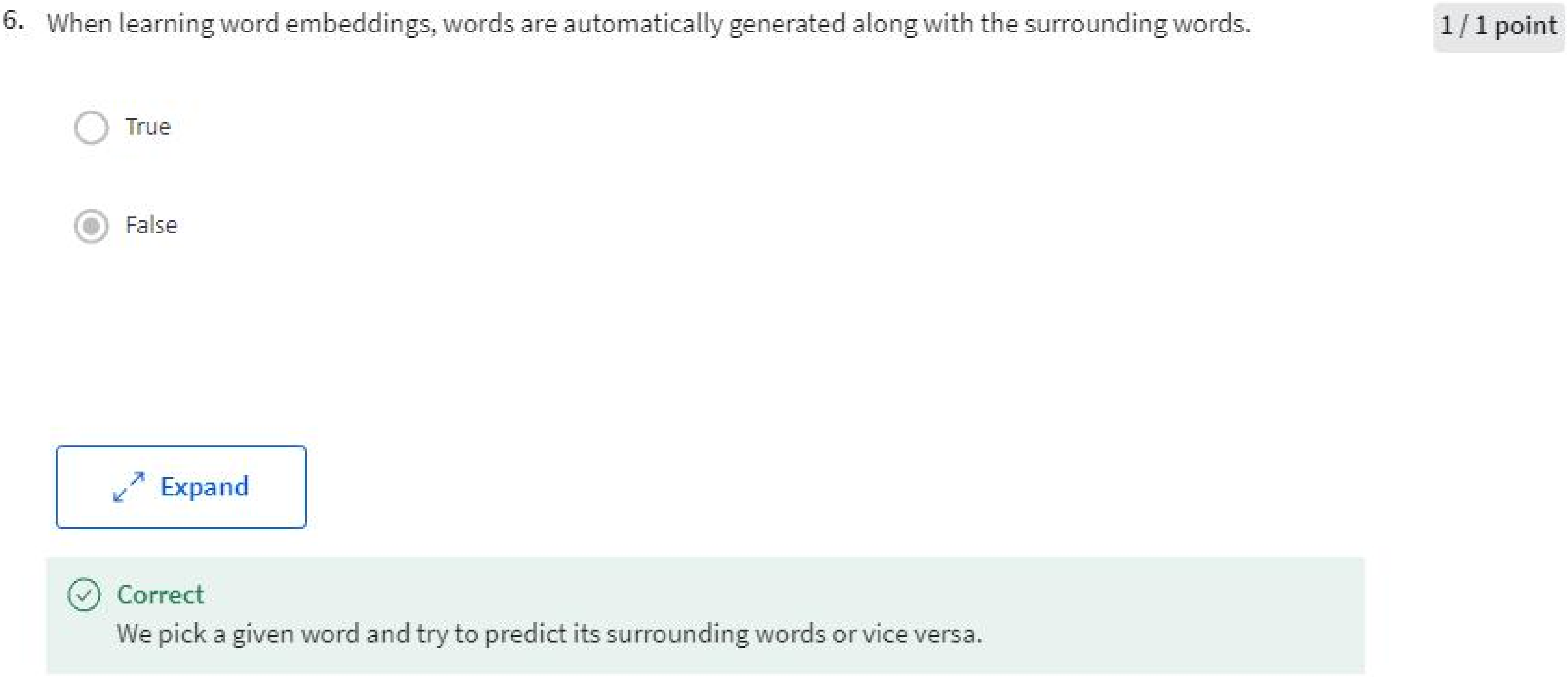
1 / 1 point

● False

○ True

✓ Correct

It is computationally wasteful because the element-wise multiplication will be extremely inefficient.



6. When learning word embeddings, words are automatically generated along with the surrounding words.

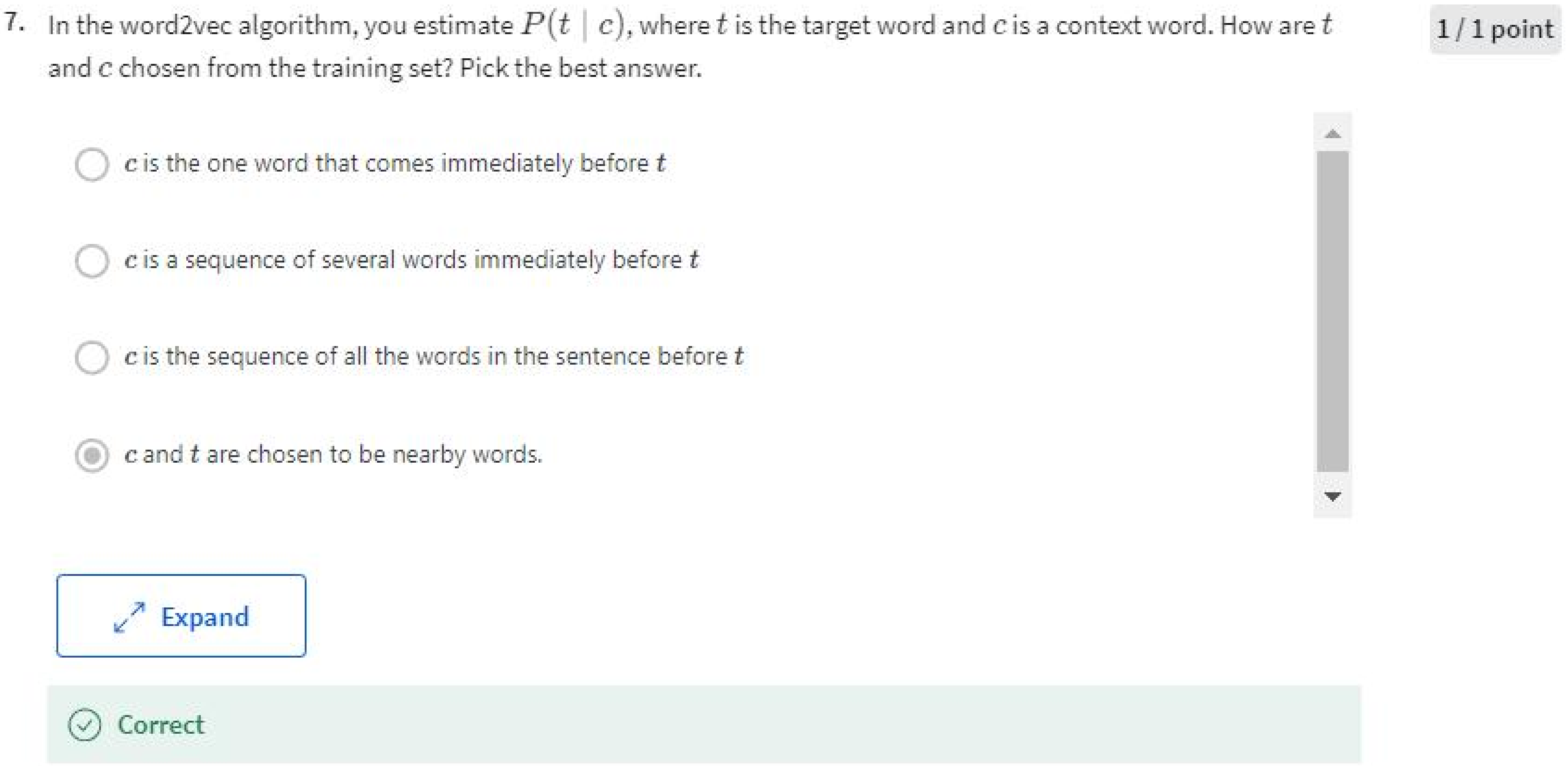
1 / 1 point

○ True

● False

✓ Correct

We pick a given word and try to predict its surrounding words or vice versa.



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

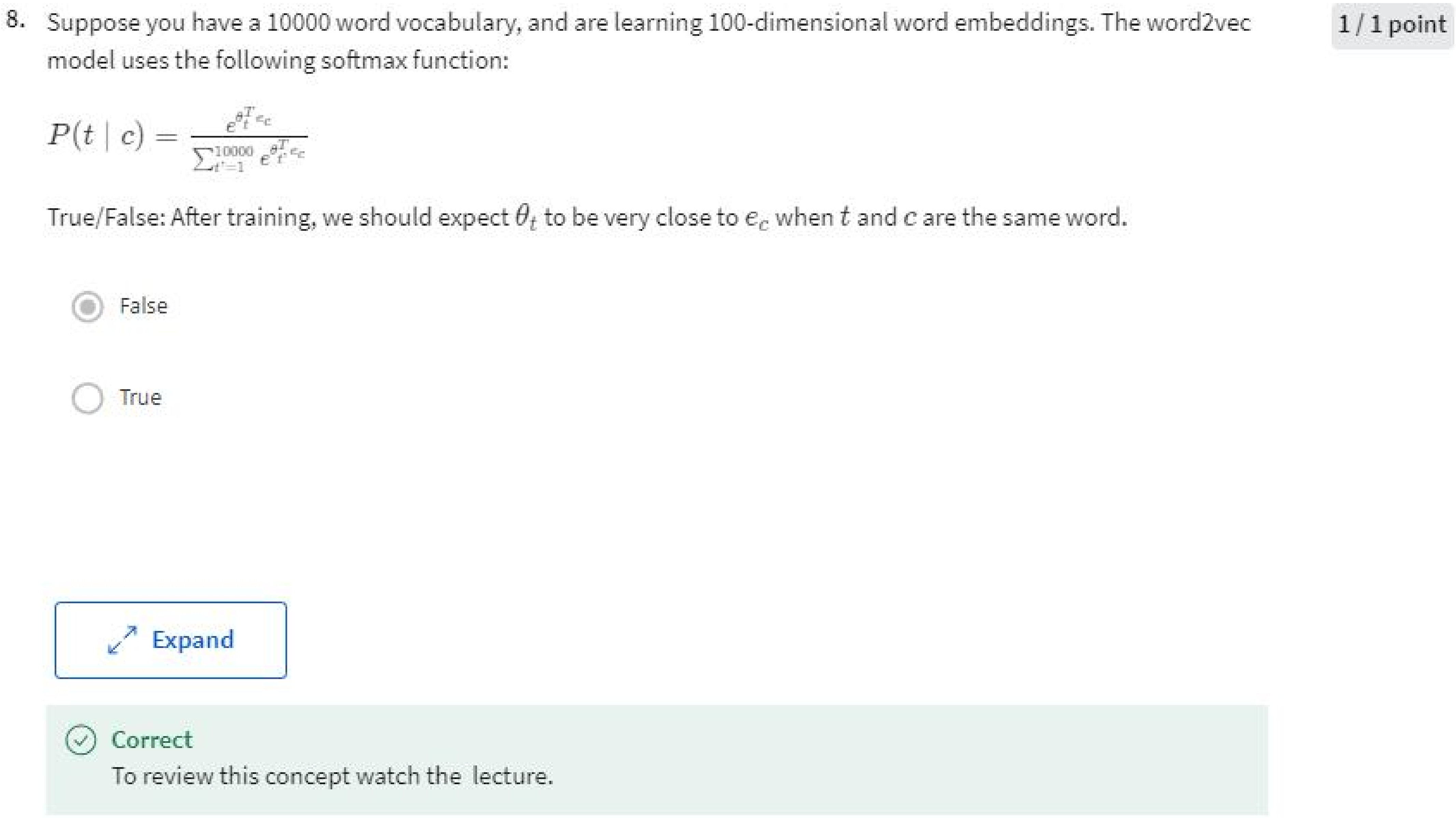
○ c is the one word that comes immediately before t

○ c is a sequence of several words immediately before t

○ c is the sequence of all the words in the sentence before t

● c and t are chosen to be nearby words.

Correct



8. Suppose you have a 10000 word vocabulary, and are learning 100-dimensional word embeddings. The word2vec model uses the following softmax function:

1 / 1 point

$$P(t \mid c) = \frac{e^{\theta_t^T e_c}}{\sum_{t'=1}^{10000} e^{\theta_{t'}^T e_c}}$$

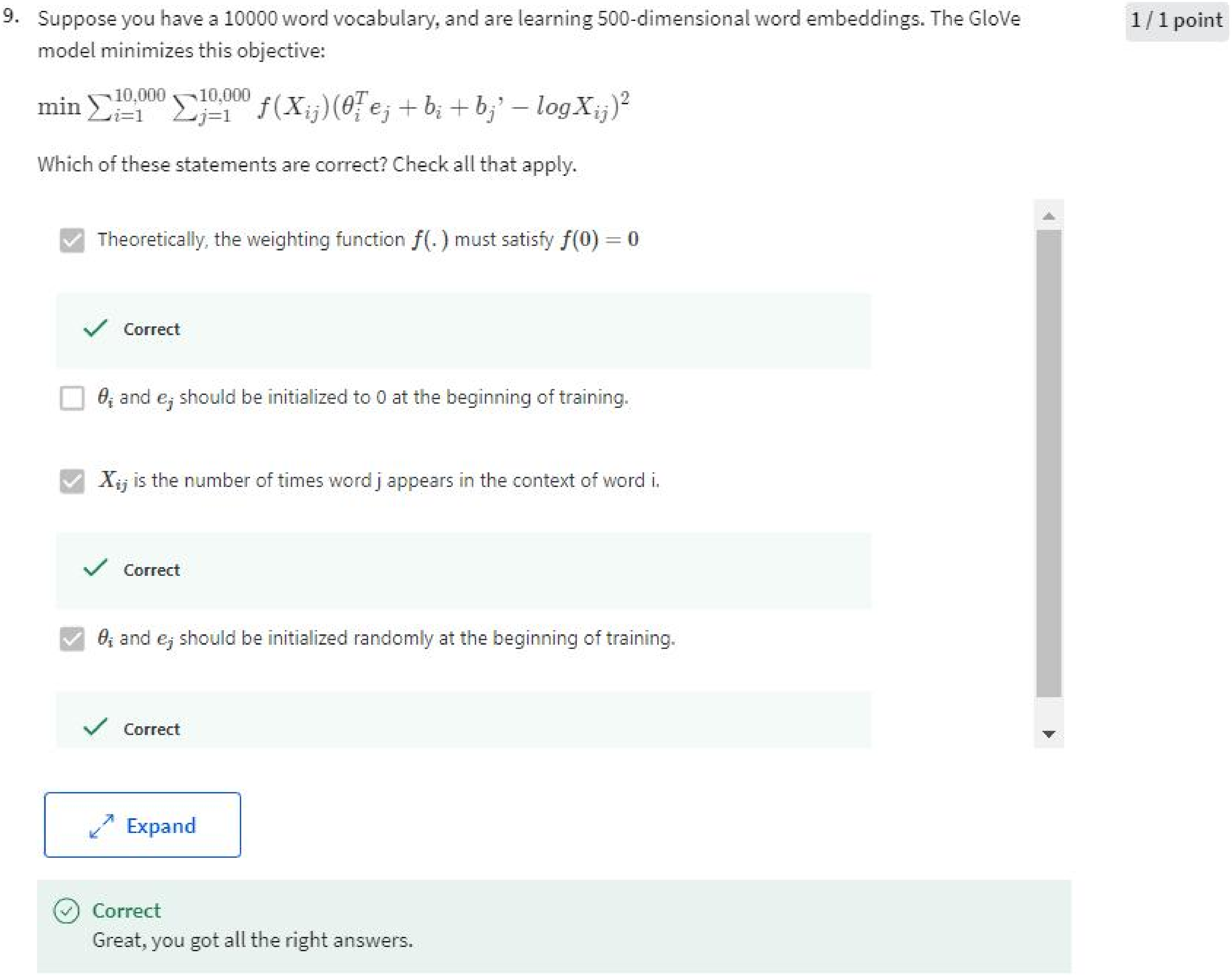
True/False: After training, we should expect θ_t to be very close to e_c when t and c are the same word.

● False

○ True

Correct

To review this concept watch the lecture.



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

1 / 1 point

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

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

☑ Theoretically, the weighting function $f(.)$ must satisfy $f(0) = 0$

✓ Correct

□ θ_i and e_j should be initialized to 0 at the beginning of training.

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

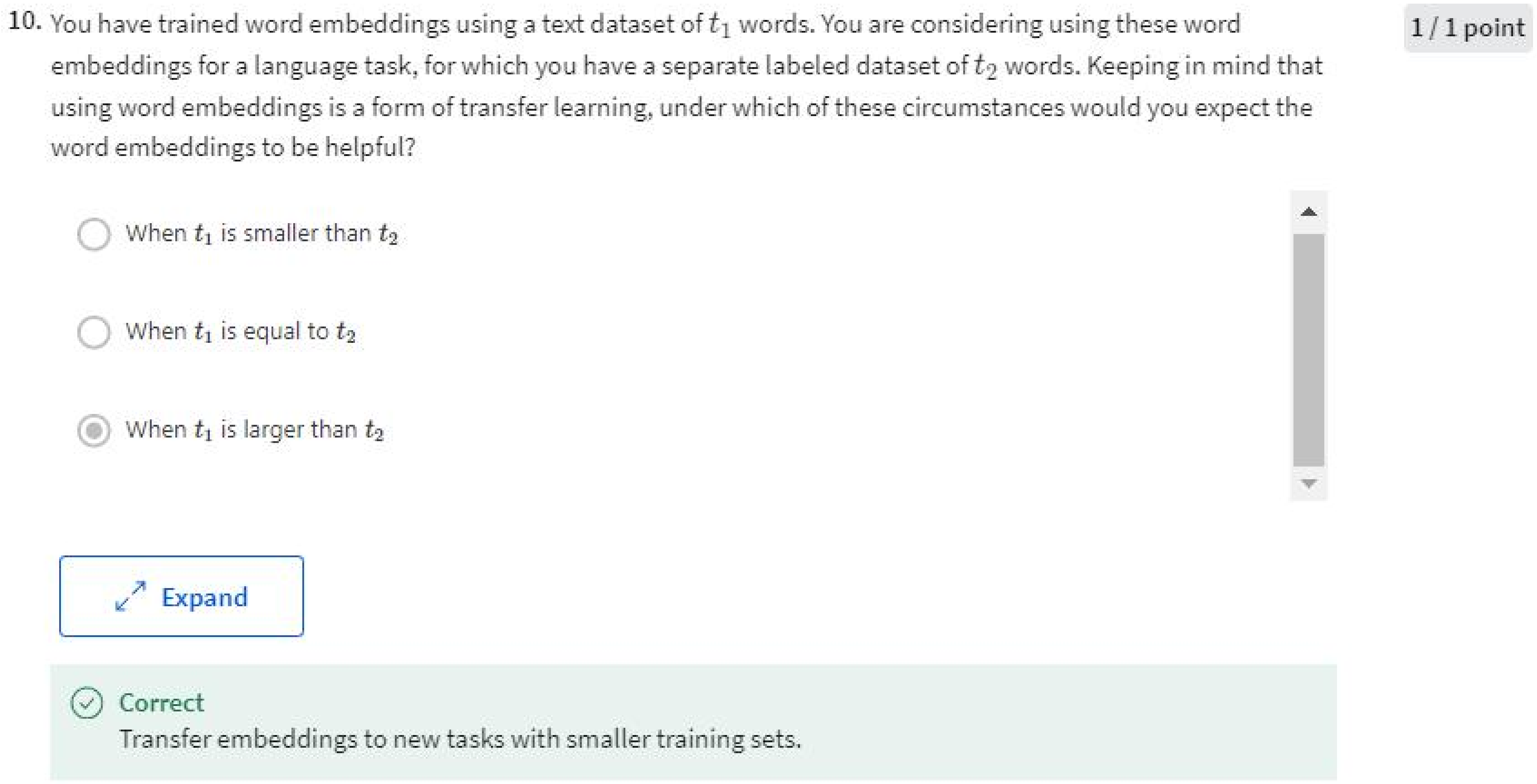
✓ Correct

☑ θ_i and e_j should be initialized randomly at the beginning of training.

✓ Correct

Correct

Great, you got all the right answers.



10. You have trained word embeddings using a text dataset of t_1 words. You are considering using these word embeddings for a language task, for which you have a separate labeled dataset of t_2 words. Keeping in mind that using word embeddings is a form of transfer learning, under which of these circumstances would you expect the word embeddings to be helpful?

1 / 1 point

○ When t_1 is smaller than t_2

○ When t_1 is equal to t_2

● When t_1 is larger than t_2

Correct

Transfer embeddings to new tasks with smaller training sets.