

Sequence models & Attention mechanism

Quiz, 10 questions

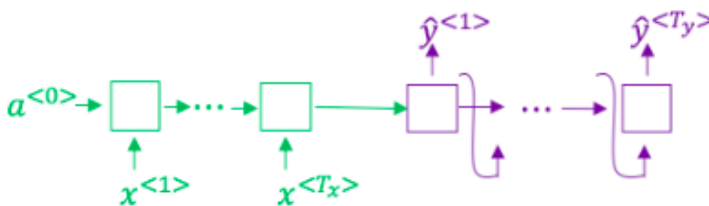
✓ **Congratulations! You passed!**

Next Item



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point

1.
Consider using this encoder-decoder model for machine translation.



This model is a “conditional language model” in the sense that the encoder portion (shown in green) is modeling the probability of the input sentence x .

- ☐ True
- ☒ False

Correct



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2.
In beam search, if you increase the beam width B , which of the following would you expect to be true? Check all that apply.

☒ Beam search will run more slowly.

Correct

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Beam search will use up more memory.

Correct



Beam search will generally find better solutions (i.e. do a better job maximizing $P(y \mid x)$)

Correct



Beam search will converge after fewer steps.

Un-selected is correct



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3.

In machine translation, if we carry out beam search without using sentence normalization, the algorithm will tend to output overly short translations.



True

Correct



False



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4.

Suppose you are building a speech recognition system, which uses an RNN model to map from audio clip x to a text transcript y . Your algorithm uses beam search to try to find the value of y that maximizes $P(y | x)$.

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On a dev set example, given an input audio clip, your algorithm outputs the transcript $\hat{y} = \text{"I'm building an A Eye system in Silly con Valley."}$, whereas a human gives a much superior transcript $y^* = \text{"I'm building an AI system in Silicon Valley."}$

According to your model,

$$P(\hat{y} | x) = 1.09 * 10^{-7}$$

$$P(y^* | x) = 7.21 * 10^{-8}$$

Would you expect increasing the beam width B to help correct this example?

☒ No, because $P(y^* | x) \leq P(\hat{y} | x)$ indicates the error should be attributed to the RNN rather than to the search algorithm.



Correct

☐ No, because $P(y^* | x) \leq P(\hat{y} | x)$ indicates the error should be attributed to the search algorithm rather than to the RNN.

☐ Yes, because $P(y^* | x) \leq P(\hat{y} | x)$ indicates the error should be attributed to the RNN rather than to the search algorithm.

☐ Yes, because $P(y^* | x) \leq P(\hat{y} | x)$ indicates the error should be attributed to the search algorithm rather than to the RNN.



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5.

Continuing the example from Q4, suppose you work on your algorithm for a few more weeks, and now find that for the vast majority of examples on which your algorithm makes a mistake, $P(y^* | x) > P(\hat{y} | x)$. This suggests you should focus your attention on improving the search algorithm.

☒ True.



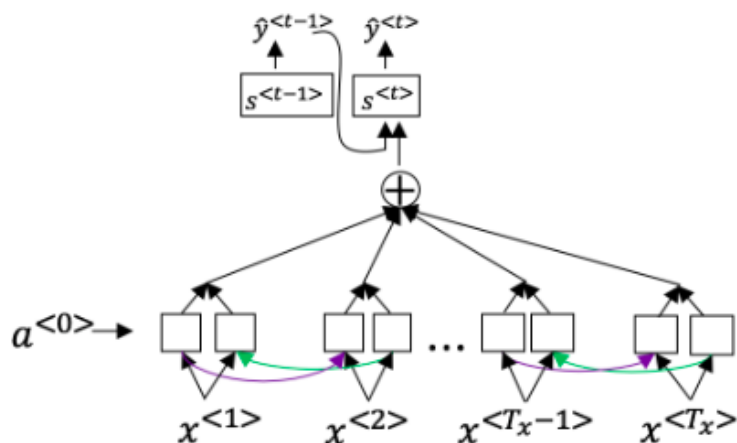
Correct

☐ False.

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Consider the attention model for machine translation.



Further, here is the formula for $\alpha^{<t,t'>}$.

$$\alpha^{<t,t'>} = \frac{\exp(e^{<t,t'>})}{\sum_{t'=1}^{T_x} \exp(e^{<t,t'>})}$$

Which of the following statements about $\alpha^{<t,t'>}$ are true? Check all that apply.

- ☐ We expect $\alpha^{<t,t'>}$ to be generally larger for values of $a^{<t'>}$ that are highly relevant to the value the network should output for $y^{<t>}$. (Note the indices in the superscripts.)

Correct

- ☐ We expect $\alpha^{<t,t'>}$ to be generally larger for values of $a^{<t>}$ that are highly relevant to the value the network should output for $y^{<t'>}$. (Note the indices in the superscripts.)

Un-selected is correct

- ☐ $\sum_t \alpha^{<t,t'>} = 1$ (Note the summation is over t .)

Un-selected is correct

- ☐ $\sum_{t'} \alpha^{<t,t'>} = 1$ (Note the summation is over t' .)

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7.

The network learns where to “pay attention” by learning the values $e^{<t,t'>}$, which are computed using a small neural network:

We can't replace $s^{<t-1>}$ with $s^{<t>}$ as an input to this neural network. This is because $s^{<t>}$ depends on $\alpha^{<t,t'>}$ which in turn depends on $e^{<t,t'>}$; so at the time we need to evaluate this network, we haven't computed $s^{<t>}$ yet.



True

Correct



False



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8.

Compared to the encoder-decoder model shown in Question 1 of this quiz (which does not use an attention mechanism), we expect the attention model to have the greatest advantage when:



The input sequence length T_x is large.

Correct



The input sequence length T_x is small.



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9.

Under the CTC model, identical repeated characters not separated by the “blank” character () are collapsed. Under the CTC model, what does the following string collapse to?

__c__o__o__k__b__o__o__o__o__o__o__o__k__k__



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cook book



coookkbooooooooookkk



This should not be selected



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10.

In trigger word detection, $x^{<t>}$ is:



Features of the audio (such as spectrogram features) at time t .



Correct



The t -th input word, represented as either a one-hot vector or a word embedding.



Whether the trigger word is being said at time t .



Whether someone has just finished saying the trigger word at time t .

