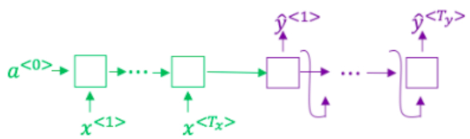
Congratulations! You passed!

Grade received 100% **Latest Submission Grade** 100% **To pass** 80% or higher

Go to next item

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

1 / 1 point



True/False: This model is a "conditional language model" in the sense that the decoder portion (shown in green) is modeling the probability of the input sentence x.

- ○ True
- ◉ False

Expand

Correct
The encoder-decoder model for machine translation models the probability of the output sentence y conditioned on the input sentence x. The encoder portion is shown in green, while the decoder portion is shown in purple.

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.

1 / 1 point

- [x] Beam search will use up more memory.

  ✓ **Correct**

- [x] 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.
- [x] Beam search will run more slowly.

  ✓ **Correct**

Expand

Correct
Great, you got all the right answers.

3. True/False: In machine translation, if we carry out beam search using sentence normalization, the algorithm will tend to output overly short translations.

1 / 1 point

- True
- False

Expand

Correct

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

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 $P(y \mid x)$.

1 / 1 point

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

According to your model,

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

$P(y^* \mid x) = 7.21 * 10^-8$

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

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

Expand

Correct

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, $P(y^* \mid x) > P(\hat{y} \mid x)$. This suggests you should focus your attention on improving the search algorithm.

1 / 1 point

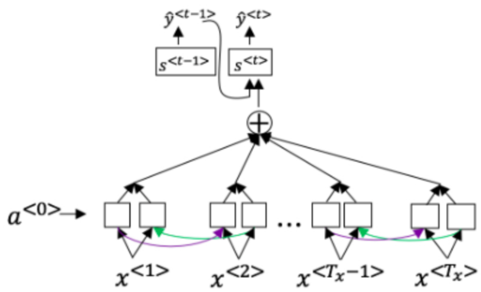
- False.
- True.

Expand

Correct

6. Consider the attention model for machine translation.

1 / 1 point



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.

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

Correct

Correct! If we sum over $\alpha^{<t,t'>}$ for all t' (the formulation can be seen in the image), the numerator will be equal to the denominator, therefore, $\sum_{t'} \alpha^{<t,t'>} = 1$.

- [ ] 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.)**
- [x] 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

Correct! $\alpha^{<t,t'>}$ is equal to the amount of attention $y^{<t>}$ should pay to $a^{< t' >}$. So, if a value of $a^{< t' >}$ is highly relevant to $y^{<t>}$, then the attention coefficient $\alpha^{<t,t'>}$ should be larger. Note the difference between a (activation) and α (attention coefficient).

Expand

Correct

Great, you got all the right answers.

7. The network learns where to "pay attention" by learning the values $e^{<t,t'>}$, which are computed using a small neural network: **1 / 1 point**

Which of the following does $s^{<t>}$ depend on? Select all that apply.

- [ ] s^t is independent of $\alpha^{<t,t'>}$ and $e^{<t,t'>}$.
- [ ] $s^{<t+1>}$
- [x] $e^{<t,t'>}$

Correct

$s^{<t>}$ depends on $\alpha^{<t,t'>}$ which in turn depends on $e^{<t,t'>}$.

- [x] $\alpha^{<t,t'>}$

Correct

$s^{<t>}$ depends on $\alpha^{<t,t'>}$ which in turn depends on $e^{<t,t'>}$

Expand

Correct
Great, you got all the right answers.

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:

1 / 1 point

- (selected) The input sequence length T_x is large.
- The input sequence length T_x is small.

Expand

Correct

9.

1 / 1 point

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?

aaa_aaaaaa________rr_dddddddd_______v_aaaaaa_rrrr________kk

- (selected) aardvark
- ardvark
- aaaaaaaaarrdddddddddvaaaaaarrrrkk
- aa rd var k

Expand

Correct
The basic rule for the CTC cost function is to collapse repeated characters not separated by "blank". If a character is repeated, but separated by a “blank”, it is included in the string.

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

1 / 1 point

- 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.
- (selected) Features of the audio (such as spectrogram features) at time t.
- Whether someone has just finished saying the trigger word at time t.

Expand

Correct