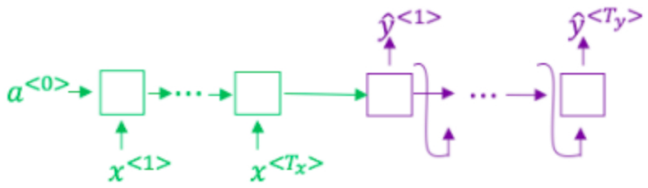
# Congratulations! You passed!

**Grade received** 90% **Latest Submission Grade** 90% **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 $x$.

- (•) False
- ( ) True

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 decrease the beam width $B$, which of the following would you expect to be true? Select all that apply. **0 / 1 point**

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

! **This should not be selected**
As the beam width decreases, beam search runs more quickly, uses up less memory, and converges after fewer steps, but will generally not find the maximum P(y|x).

- [ ] Beam search will converge after fewer steps.
- [ ] Beam search will run more quickly.
- [x] Beam search will generally find better solutions (i.e. do a better job maximizing $P(y \mid x)$).

! **This should not be selected**
As the beam width decreases, beam search runs more quickly, uses up less memory, and converges after fewer steps, but will generally not find the maximum P(y|x).

Expand

✗ **Incorrect**
You didn't select all the correct answers

**3.** True/False: In machine translation, if we carry out beam search without using sentence normalization, the algorithm will tend to output overly long translations. **1 / 1 point**

- (•) False
- ( ) True

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?

- 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.
- 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.
- **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.**
- 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.

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.

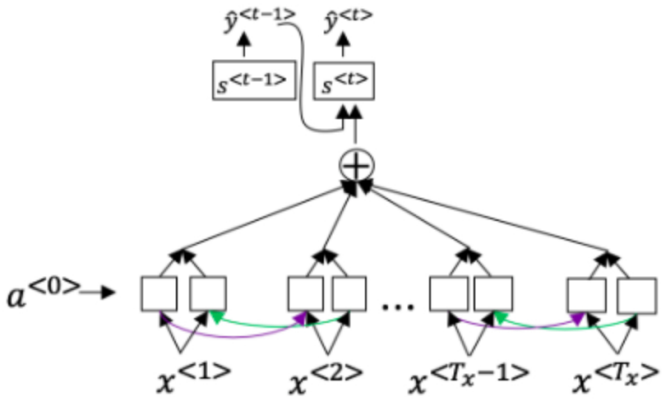
**1 / 1 point**

- **True.**
- False.

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] 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

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

  ✓ 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.)

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

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

We can replace $s^{<t-1>}$ with $s^{<t>}$ as an input to this neural network because $s^{<t>}$ is independent of $\alpha^{<t,t'>}$ and $e^{<t,t'>}$.

- ○ True
- ◉ False

Expand

**Correct**
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 and $$e^{<t,t'>}$$; so at the time we need to evaluate this network, we haven't computed $$s^{<t>}$$.

**8.** The attention model performs the same as the encoder-decoder model, no matter the sentence length. **1 / 1 point**

- ○ True
- ◉ False

Expand

**Correct**
The performance of the encoder-decoder model declines as the amount of words increases. The attention model has the greatest advantage when the input sequence length $$T_x$$ is large.

**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_ddddddddd_____v_aaaaaa_rrrr_____kk

- ○ aaaaaaaaarrddddddddvaaaaaarrrrkk
- ○ aa rd var k

- ardvark
- aardvark

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, if the target label for $x^{<t>}$ is 1: **1 / 1 point**

- Only one word has been stated.
- There is exactly one trigger word.
- The total time that the trigger word detection algorithm has been running is 1.
- Someone has just finished saying the trigger word at time t.

Expand

**Correct**
Target labels indicate whether or not a trigger word has been said.