

20233_csci_544_30249:
Applied Natural
Language Processing

Announcements

Syllabus

Content

Assignments

Tools

USC Code of Ethics

Review Test Submission: Quiz 7

User	Kayvan Shah
Course	20233_csci_544_30249: Applied Natural Language Processing
Test	Quiz 7
Started	10/31/23 5:35 PM
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Time Elapsed	9 minutes out of 10 minutes
Results Displayed All Answers, Submitted Answers, Correct Answers	

Question 1

10 out of 10 points

What are the foundational assumptions of the IBM Model 1 for machine translation?

- Selected Answers: ☒ All possible alignments between source and target language sentences are equally likely.
☒ Each word in the target language is generated independently from the source language words.
- Answers: ☒ All possible alignments between source and target language sentences are equally likely.
The translation probability of a word depends on its position in the sentence.
☒ Each word in the target language is generated independently from the source language words.
Contextual information is crucial for accurate translation.

Question 2

10 out of 10 points

In the context of phrase-based translation, what is a 'phrase table' primarily used for?

- Selected Answer: ☒ Mapping phrases from the source language to corresponding phrases in the target language.
- Answers: ☐ Storing common phrases to speed up the translation process.
☒ Mapping phrases from the source language to corresponding phrases in the target language.
☐ Cataloging grammatical rules and exceptions for each language involved.
☐ A lookup table for syntactic parsing rules.

Question 3

10 out of 10 points

Which of the following best describes a challenge associated with the EM algorithm?

- Selected Answer: ☒ The EM algorithm can converge to different solutions depending on the initial parameter estimates.
- Answers: ☐ The EM algorithm always converges to the global optimum of the likelihood function.
☐ The EM algorithm requires a large amount of labeled data for accurate parameter estimation.
☒ The EM algorithm can converge to different solutions depending on the initial parameter estimates.
☐ The EM algorithm is computationally less intensive compared to other iterative algorithms.

Question 4

10 out of 10 points

Which of the following statements describe the limitations of IBM Model 1?

- Selected Answers: ☒ It does not consider word context in translation.
☒ It cannot handle non-literal translations effectively.
☒ It treats all possible alignments with equal probability.
- Answers: ☒ It does not consider word context in translation.
☒ It cannot handle non-literal translations effectively.
☐ It is sensitive to the size of the training corpus.
☒ It treats all possible alignments with equal probability.

Question 5

10 out of 10 points

In phrase-based translation models, what is the significance of 'language modeling'?

Selected Answer: ☒ It predicts the likelihood of a sequence of words in the target language.

Answers:

- It is used to recognize speech in the source language.
- It is used for the phonetic translation of words.
- ☒ It predicts the likelihood of a sequence of words in the target language.
- It models the syntactic structure of the source language.

Question 6

10 out of 10 points

In phrase-based translation models, what is a critical step in extracting phrase pairs from a parallel corpus?

Selected Answer: ☒ Identifying and aligning phrases based on statistical significance and frequency of occurrence.

Answers:

- Applying part-of-speech tagging to identify noun and verb phrases separately.
- Using a bilingual dictionary to align phrases manually.
- ☒ Identifying and aligning phrases based on statistical significance and frequency of occurrence.
- Implementing syntactic parsing to establish grammatical relationships between words in a phrase.

Question 7

10 out of 10 points

In phrase-based translation models, what role does 'translation probabilities' play?

Selected Answer: ☒ Matching words or phrases in the source language with their equivalents in the target language.

Answers:

- Aligning voice with text for better speech recognition.
- ☒ Matching words or phrases in the source language with their equivalents in the target language.
- Aligning the translation model with neural network parameters.
- Ensuring syntactical alignment in the source and target languages.

Question 8

10 out of 10 points

Which technique is often employed in phrase-based translation models to handle the reordering of phrases?

Selected Answer: ☒ Distance-based reordering models

Answers:

- N-gram modeling
- Beam search algorithms
- Convolutional neural networks
- ☒ Distance-based reordering models

Question 9

10 out of 10 points

What is the primary purpose of the Expectation step in the EM algorithm?

Selected Answer: ☒ To estimate the probability distribution of the hidden variables given the observed data and current parameter estimates.

Answers:

- To maximize the likelihood function based on current parameter estimates.
- To update the model parameters based on the expected complete data log-likelihood.
- ☒ To estimate the probability distribution of the hidden variables given the observed data and current parameter estimates.
- To compute the definitive classification of data points into distinct clusters.

Question 10

10 out of 10 points

What is a key feature that distinguishes IBM Model 2 from IBM Model 1 in machine translation?

Selected Answer: ☒ IBM Model 2 adds a non-uniform positional alignment model to account for the relative positioning of words.

Answers:

- IBM Model 2 introduces a fertility model to handle the dropping and adding words.
- ☒ IBM Model 2 adds a non-uniform positional alignment model to account for the relative positioning of words.
- IBM Model 2 incorporates a deep learning approach for context understanding.
- IBM Model 2 utilizes a grammar-based translation system.

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