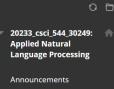
Home

🡤 Kayvan Shah 🔼 🔻

Assignments

Review Test Submission: Quiz 3



Syllabus

Content

Assignments

Tools

USC Code of Ethics

# Review Test Submission: Quiz 3

Answers:

User	Kayvan Shah
Course	20233_csci_544_30249: Applied Natural Language Processing
Test	Quiz 3
Started	9/12/23 5:35 PM
Submitted	9/12/23 5:45 PM
Due Date	9/12/23 5:50 PM
Status	Completed
Attempt Score	26.667 out of 100 points
Time Elapsed	9 minutes out of 10 minutes

Question 1 0 out of 10 points

Select the correct answer(s) regarding the machine learning algorithms:

Selected Answers: ORF is a generative approach to sequence labeling.

& Logistic regression is a discriminative approach to sequence labeling.

Naive Bayes, is a generative approach to classification.

MEMM is a discriminative approach to sequence labeling.

CRF is a generative approach to sequence labeling.

Logistic regression is a discriminative approach to sequence labeling.

Naive Bayes, is a generative approach to classification.

MEMM is a discriminative approach to sequence labeling.

Question 2 0 out of 10 points

Consider this SVD decomposition for the matrix  $A = \begin{bmatrix} 3 & 2 & 2 \\ 2 & 3 & -2 \end{bmatrix}$  as:

$$A = \begin{bmatrix} \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} \\ \frac{1}{\sqrt{2}} & \frac{-1}{\sqrt{2}} \end{bmatrix} \begin{bmatrix} 5 & 0 & 0 \\ 0 & 3 & 0 \end{bmatrix} \begin{bmatrix} \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} & 0 \\ \frac{1}{\sqrt{18}} & \frac{-1}{\sqrt{18}} & \frac{4}{\sqrt{18}} \\ \frac{2}{3} & \frac{-2}{3} & \frac{-1}{3} \end{bmatrix}$$

What would be the new representation of A after keeping only the most important singular value?

Selected Answer:

$$\left[\frac{10}{3}\right]$$

Answers:

$$\left[ \frac{10}{3} \right]$$

$$\begin{bmatrix} \frac{5}{2} & \frac{-3}{2} & 0 \\ \frac{-3}{2} & \frac{5}{2} & 0 \end{bmatrix}$$

$$\begin{bmatrix} \frac{3}{2} & \frac{3}{2} & 0 \\ \frac{5}{2} & \frac{5}{2} & 0 \end{bmatrix}$$

$$\begin{bmatrix} \frac{3}{2} & \frac{3}{2} & 0 \\ 3 & 3 & 0 \end{bmatrix}$$

# Question 3

Select the correct answer(s):

Answers:

Selected Answers: 👩 LSA is a term weighting-based model and considers occurrences of terms at the document level.

GloVe is a count-based model that considers occurrences of terms at the context level.

Word2Vec is a prediction-based model that considers occurrences of terms at the document level.

10 out of 10 points

LSA is a term weighting-based model and considers occurrences of terms at the document level.

GloVe is a count-based model that considers occurrences of terms at the context level.

### **Question 4** 6.667 out of 10 points

Select all that apply to the Word2Vec:

Selected Answers: 🚫 Word2Vec uses a two-layer neural network architecture.

To train a Word2Vec model, explicit supervision from a human annotator is needed to label the dataset.

✓ Word2Vec uses a two-layer neural network architecture. Answers:

To train a Word2Vec model, explicit supervision from a human annotator is needed to label the dataset.

Word2Vec can capture only syntactic information, not semantic meaning.

Similar to the Bag-of-words method, Word2Vec does not involve neighboring words in extracting word embeddings.

#### **Question 5** 0 out of 10 points

Consider an HMM with two states  $S_1$  and  $S_2$  with two observations  $X_1$  and  $X_2$ . In this case,  $p\left(X_2|S_1\right)$  can be written as:

Selected Answer: 
$$\sum\nolimits_{S_{2}} p\left(S_{1} \bigm| S_{2}\right) p\left(X_{2} \bigm| S_{2}\right)$$

Answers:

$$p(S_1|X_2)p(X_2)$$

$$\sum_{X_1} p(X_1 \mid S_1) p(X_2 \mid X_1)$$

#### Question 6 0 out of 10 points

Which of the following is incorrect about SVD decomposition?

Selected Answer: Computational complexity of SVD is  $O(mn^2)$  for an  $n \times m$  matrix.

Many singular values are going to be zero or negligible and can be dropped. Answers:

SVD is flexible to adding new words. Rows of the  ${\cal U}$  matrix can be used as word embeddings.

Computational complexity of SVD is  $O(mn^2)$  for an  $n \times m$  matrix.

## Question 7 0 out of 10 points

Which of the following equations is not necessarily correct in the SVD decomposition?

Selected Answer:  $A = U \Sigma V^{-1}$ 

Answers:

$$VV^T = V^T V$$

$$U^T A = \Sigma V^T$$

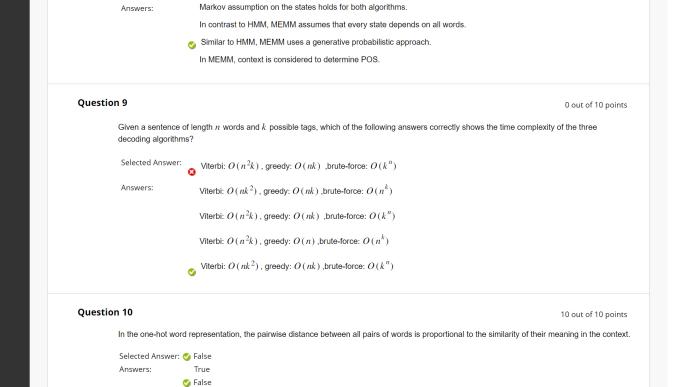
$$A = U\Sigma V^{-1}$$

$$\Sigma = \Sigma^T$$

#### **Question 8** 0 out of 10 points

Which of the following is not true when comparing HMMs with MEMMs?

Selected Answer: 🔥 In contrast to HMM, MEMM assumes that every state depends on all words.



Saturday, January 20, 2024 11:37:05 PM PST

 $\leftarrow \text{OK}$