

CS7641 ML Practice Quiz

Module UL 4: Feature Transformation

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Question 1

What is the primary goal of feature transformation in machine learning?

- A. To create a new set of features that is more compact while retaining as much relevant and useful information as possible.
- B. To classify and label data in supervised learning.
- C. To increase the dimensionality of the feature space.
- D. To focus only on feature selection without creating new features.
- E. To apply non-linear transformations to all features.

Question 2

What is the main problem addressed by feature transformation when using words as features in machine learning?

- A. The difficulty in finding synonyms for each word.
- B. The challenge of defining words in different languages.
- C. The issues of polysemy (multiple meanings) and synonymy (same meaning) leading to false positives and negatives.
- D. The inability to use words as features in numerical algorithms.
- E. The excessive time required to process textual data.

Question 3

What does Principal Components Analysis (PCA) primarily focus on in feature transformation?

- A. Maximizing the statistical independence between new features.
- B. Finding directions that maximize variance and are mutually orthogonal.
- C. Reducing the dimensionality by creating new features based on correlations.
- D. Identifying the least variance in the data for dimension reduction.
- E. Creating non-linear combinations of the original features.

Question 4

Which of the following is a key difference between Principal Component Analysis (PCA) and Independent Component Analysis (ICA)?

- A. PCA focuses on maximizing independence, while ICA focuses on maximizing correlation.
- B. PCA aims to find dimensions that maximize variance, while ICA focuses on finding mutually independent features.
- C. PCA is used only in supervised learning, while ICA is used in unsupervised learning.
- D. PCA transforms features into new features with maximum entropy, while ICA minimizes entropy.
- E. PCA and ICA are identical in terms of their goals and methods.

Question 5

What is the main advantage of Random Components Analysis (RCA) in feature transformation?

- A. It produces more complex models than PCA and ICA.
- B. It is cheaper and faster to implement.
- C. It focuses on maximizing the mutual information.
- D. It uses non-linear transformations for better accuracy.
- E. It requires a larger number of dimensions than PCA.

Answer Key

1. A
2. C
3. B
4. B
5. B