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