1. What is feature extraction in machine learning?

a) The process of selecting the most relevant features from a dataset
b) The process of transforming raw data into a new feature space
c) The process of training a model to classify features
d) The process of adding noise to the features

Answer: b) The process of transforming raw data into a new feature space

Explanation: Feature extraction involves transforming raw data into a new feature space, typically with reduced dimensionality or enhanced discriminative power.

2. Which of the following is NOT a type of feature extraction?

a) Principal Component Analysis (PCA)
b) Singular Value Decomposition (SVD)
c) Recursive Feature Elimination (RFE)
d) Decision Tree

Answer: d) Decision Tree

Explanation: Decision Tree is a machine learning algorithm used for classification or regression, not a feature extraction technique.

3. What is the primary goal of feature selection?

a) To increase the computational complexity of the model
b) To decrease the interpretability of the model

c) To improve the performance of the model by selecting the most relevant features
d) To introduce noise into the dataset

Answer: c) To improve the performance of the model by selecting the most relevant features

Explanation: Feature selection aims to improve the model's performance by selecting the most relevant features while reducing dimensionality.

4. Which algorithm is used for feature selection that exhaustively evaluates all possible feature subsets?

a) Branch and Bound Algorithm
b) Sequential Forward Selection (SFS)
c) Sequential Backward Selection (SBS)
d) (l,r) Algorithm

Answer: a) Branch and Bound Algorithm

Explanation: Branch and Bound Algorithm exhaustively evaluates all possible feature subsets to find the optimal subset.

5. Which feature selection algorithm evaluates feature subsets by progressively adding features one at a time?

a) Branch and Bound Algorithm
b) Sequential Forward Selection (SFS)
c) Sequential Backward Selection (SBS)
d) (l,r) Algorithm

Answer: b) Sequential Forward Selection (SFS)

Explanation: Sequential Forward Selection progressively adds features one at a time to evaluate the feature subsets.

6. Which algorithm iteratively removes features from the feature set until no improvement is observed in a specified performance metric?

a) Branch and Bound Algorithm
b) Sequential Forward Selection (SFS)
c) Sequential Backward Selection (SBS)
d) (l,r) Algorithm

Answer: c) Sequential Backward Selection (SBS)

Explanation: Sequential Backward Selection iteratively removes features until no improvement is observed in the performance metric.

7. What is the primary limitation of the Branch and Bound Algorithm for feature selection?

a) It is computationally expensive for large feature sets
b) It tends to overfit the model
c) It requires labeled data for training
d) It cannot handle categorical features

Answer: a) It is computationally expensive for large feature sets

Explanation: Branch and Bound Algorithm becomes computationally expensive when dealing

with large feature sets due to its exhaustive nature.

8. Which feature selection algorithm is more suitable for high-dimensional datasets?

a) Branch and Bound Algorithm
b) Sequential Forward Selection (SFS)
c) Sequential Backward Selection (SBS)
d) (l,r) Algorithm

Answer: d) (l,r) Algorithm

Explanation: (l,r) Algorithm is designed to handle high-dimensional datasets efficiently.

9. Which algorithm combines forward and backward selection techniques for feature selection?

a) Branch and Bound Algorithm
b) Sequential Forward Selection (SFS)
c) Sequential Backward Selection (SBS)
d) (l,r) Algorithm

Answer: d) (l,r) Algorithm

Explanation: (l,r) Algorithm combines elements of both forward and backward selection techniques for feature selection.

10. In which scenario would feature extraction be more beneficial than feature selection?

a) When dealing with a dataset with a small number of features
b) When computational resources are limited
c) When the interpretability of the model is crucial
d) When dealing with high-dimensional data

Answer: d) When dealing with high-dimensional data

Explanation: Feature extraction is more beneficial when dealing with high-dimensional data, as it aims to transform the data into a lower-dimensional space while preserving relevant information.

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