Quiz 3

Score: 10/10

✓

1. What is the main difference between linear and logistic regression?

Linear regression is used for classification problems, while logistic regression is used for regression problems.

Linear regression uses a linear equation for predictions, while logistic regression uses a logistic or sigmoid function.

Linear regression handles categorical data, while logistic regression handles numerical data.

Linear regression is non-parametric, while logistic regression is parametric.

Explanation

The main difference between linear and logistic regression is that linear regression is used to predict continuous values, while logistic regression is used to predict binary outcomes.

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2. In linear regression, what is the purpose of the cost function?

To calculate the R-squared value of the model.

To measure the accuracy of the model's predictions.

To minimize the difference between predicted and actual values.

To regularize the model and prevent overfitting.

Explanation

The cost function in linear regression is used to measure the difference between the predicted values and the actual values. It helps in finding the best-fitting line by minimizing the cost function.

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3. What is the advantage of using support vector machines (SVM) for classification?

SVM is not effective in high-dimensional spaces.

SVM only works well with a small number of features.

SVM is effective in high-dimensional spaces and versatile with Kernel

Explanation

One advantage of using support vector machines for classification is their effectiveness in high-dimensional spaces, even where the number of dimensions is greater than the number of samples. They are also versatile as different Kernel functions can be specified for the decision function.

functions.

SVM cannot handle non-linear decision boundaries.

4. What does the 'support vector' refer to in Support Vector Machines (SVM)?

The data points that are closest to the decision boundary.

The outliers in the dataset.

The features with the highest importance.

The misclassified data points.

Explanation

Support vectors are the data points that are the closest to the decision boundary (hyperplane) and ultimately determine the position and orientation of the hyperplane.

5. What is the purpose of the kernel trick in SVM?

To reduce the dimensionality of the data.

To explicitly calculate the new coordinates of the data.

To operate in a higher-dimensional space efficiently without explicit calculations.

To regularize the model and prevent overfitting.

Explanation

The kernel trick allows SVM to operate in a higher-dimensional space without explicitly calculating the new coordinates of the data, which can lead to efficient classification of non-linear data.

6. What is the objective of Support Vector Regression (SVR)?

To minimize the mean squared error.

To find the best-fitting line within a specified margin.

To classify data points using a hyperplane.

To maximize the margin between support vectors.

Explanation

The objective of SVR is to find the best-fitting line within a specified margin that captures a specific percentage of the data points.

7. What does the entropy measure in decision trees represent?

The level of information gain at a particular node.

The impurity or randomness in a dataset.

The depth of a decision tree.

The accuracy of the decision tree model.

Explanation

Entropy in decision trees represents the impurity or randomness in a dataset. A lower entropy value indicates higher homogeneity, while a higher entropy value indicates higher diversity or impurity.

8. What is pruning in the context of decision trees?

Creating new branches in the decision tree.

The process of reducing the size of the tree to prevent overfitting.

Constraining the maximum depth of the tree.

Measuring the impurity of the nodes in the tree.

Explanation

Pruning in decision trees is the process of reducing the size of the tree by removing non-essential nodes to improve its generalization ability and prevent overfitting.

9. Which of the following is a drawback of decision tree algorithms?

They are robust to overfitting.

They are not sensitive to small variations in the training data.

They are susceptible to overfitting and sensitive to small variations in the data.

They are not affected by the number of features in the dataset.

Explanation

One drawback of decision tree algorithms is their susceptibility to overfitting, especially when dealing with complex datasets with many features and deep trees. They can also be sensitive to small variations in the training data.

10. In logistic regression, the Sigmoid function is used to:

Calculate the cost function.

Classify the data points.

Explanation

The Sigmoid function in logistic regression is used to map predicted values to probabilities,

Map predicted values to probabilities.

Normalize the input features.

which ensures that the output is between 0 and 1, representing the probability of the input belonging to a certain class.