# Decision Tree-1 quiz

7 out of 7 correct

1. What is the purpose of the confusion matrix in a classification problem?

- ○ To plot the ROC curve
- ○ To calculate the accuracy of the classifier
- ◉ To evaluate the performance of the classifier
- ○ To visualize the decision boundary

**Explanation:** The confusion matrix allows us to calculate various metrics such as precision, recall, and F1 score that can help us evaluate the performance of a classification model.

2. Which of the following metrics is calculated using the true positive, false positive, and false negative values from a confusion matrix?

- ○ Accuracy
- ○ Precision
- ◉ Recall
- ○ ROC curve

**Explanation:** Recall is the ratio of true positives to the sum of true positives and false negatives and is a metric used to evaluate the ability of a classifier to correctly identify positive samples.

3. In decision tree classification, what is the role of the split criterion?

- ○ To determine the maximum depth of the tree
- ○ To determine the number of leaf nodes

- [x] To determine the best feature and threshold for splitting
- [ ] To determine the class label for each leaf node

**Explanation:** The split criterion is used to select the best feature and threshold for splitting the data at each internal node of the decision tree.

4. What is the geometric intuition behind decision tree classification?

- [ ] A decision tree is a linear classifier that separates the data with a hyperplane
- [ ] A decision tree is a non-linear classifier that separates the data with a curved surface
- [x] A decision tree partitions the data into rectangular regions in the feature space
- [ ] A decision tree projects the data onto a lower-dimensional subspace

**Explanation:** Each internal node of the decision tree corresponds to a partition of the feature space, and the decision tree classifies a sample based on the region it belongs to.

5. Which of the following metrics is used to evaluate the performance of a classifier with imbalanced class distribution?

- [ ] Accuracy
- [ ] Precision
- [ ] Recall
- [x] F1 score

**Explanation:** F1 score is a metric that takes into account both precision and recall and is therefore more appropriate for evaluating the performance of a classifier with imbalanced class distribution.

6. What is the mathematical intuition behind decision tree classification?

- ○ Decision tree classification is a probabilistic model that estimates the conditional probability of each class given the input features
- ◉ Decision tree classification is a non-parametric model that partitions the feature space into subsets that are as homogeneous as possible with respect to the target variable
- ○ Decision tree classification is a linear model that fits a linear function to the input features
- ○ Decision tree classification is a deep neural network that learns a hierarchy of features from the input data

**Explanation:** The goal of decision tree classification is to recursively partition the feature space into subsets that are as homogeneous as possible with respect to the target variable.

7. Which of the following metrics is used to evaluate the performance of a binary classifier when the cost of false positives and false negatives is not equal?

- ◉ Precision
- ○ Recall
- ○ F1 score
- ○ None of the above

**Explanation:** When the cost of false positives and false negatives is not equal, precision is the metric that should be optimized to minimize the total cost. This is because false positives have a higher cost than false negatives in this scenario.

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