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State	Finished
Completed on	Wednesday, 29 October 2025, 12:33 PM
Time taken	4 mins 36 secs
Marks	13.00/15.00
Grade	86.67 out of 100.00

Question 1

Complete

Mark 1.00 out of 1.00

In AdaBoost, how is the weight of a weak learner determined?

- ☐ a. Using gradient descent
- ☒ b. Using the formula $\alpha = (1/2)\ln((1-\epsilon)/\epsilon)$
- ☐ c. By accuracy alone
- ☐ d. Randomly initialized each time

Question 2

Complete

Mark 1.00 out of 1.00

The function $F(x) = F_{\text{prev}}(x) + \eta \cdot h(x)$ indicates:

- ☐ a. Updating weights in AdaBoost
- ☐ b. Bagging model averaging
- ☒ c. A residual correction step in Gradient Boosting
- ☐ d. Cross-validation step

Question 3

Complete

Mark 1.00 out of 1.00

What does the learning rate η control in Gradient Boosting?

- ☐ a. The number of residuals generated
- ☐ b. Tree depth
- ☒ c. The contribution of each weak learner
- ☐ d. The number of features used

Question 4

Complete

Mark 1.00 out of 1.00

What does the term "adaptive" in AdaBoost refer to?

- ☐ a. Modifying the kernel function dynamically
- ☐ b. Changing learning rate automatically
- ☐ c. Adjusting model depth at each iteration
- ☒ d. Updating the weights of samples based on errors

Question 5

Complete

Mark 1.00 out of 1.00

What happens to the sample weights after an AdaBoost iteration?

- ☒ a. Weights of misclassified samples increase
- ☐ b. Weights of correctly classified samples increase
- ☐ c. Weights remain unchanged
- ☐ d. All weights are halved

Question 6

Complete

Mark 0.00 out of 1.00

What is a key reason Gradient Boosting may overfit?

- ☐ a. Too few trees
- ☐ b. Using regularization
- ☐ c. Too many deep trees
- ☒ d. Too small learning rate

Question 7

Complete

Mark 1.00 out of 1.00

What is a residual in Gradient Boosting?

- ☐ a. The number of iterations completed
- ☐ b. The gradient of the feature vector
- ☒ c. The difference between actual and predicted values
- ☐ d. A random noise term

Question 8

Complete

Mark 1.00 out of 1.00

What is the loss function minimized by AdaBoost?

- ☐ a. Cross-entropy loss
- ☒ b. Exponential loss
- ☐ c. Mean squared error
- ☐ d. Hinge loss

Question 9

Complete

Mark 1.00 out of 1.00

What is the main goal of AdaBoost?

- ☐ a. To increase data dimensionality
- ☐ b. To minimize the mean squared error
- ☒ c. To combine multiple weak classifiers into a strong one
- ☐ d. To combine multiple strong classifiers into a weak one

Question 10

Complete

Mark 1.00 out of 1.00

What type of optimization is Gradient Boosting performing?

- ☐ a. Genetic optimization
- ☐ b. Random search
- ☒ c. Gradient descent in function space
- ☐ d. Grid search

Question 11

Complete

Mark 1.00 out of 1.00

Which modern algorithms are derived from the principle of Gradient Boosting?

- ☐ a. Logistic Regression and SVM
- ☐ b. Random Forest and Bagging
- ☐ c. PCA and t-SNE
- ☒ d. XGBoost, LightGBM, CatBoost

Question 12

Complete

Mark 0.00 out of 1.00

Which of the following is NOT an advantage of AdaBoost?

- ☐ a. Handles noise robustly
- ☐ b. Often achieves high accuracy
- ☒ c. Simplicity of implementation
- ☐ d. Works well with weak learners

Question 13

Complete

Mark 1.00 out of 1.00

Which of the following is TRUE about AdaBoost vs. Gradient Boosting?

- ☒ a. AdaBoost uses weighted data; Gradient Boosting uses residuals
- ☐ b. Both minimize exponential loss
- ☐ c. AdaBoost can use any differentiable loss
- ☐ d. Gradient Boosting works only for classification

Question 14

Complete

Mark 1.00 out of 1.00

Which of the following is usually used as a weak learner in AdaBoost?

- ☐ a. Neural network
- ☒ b. Decision stump
- ☐ c. Logistic regression
- ☐ d. K-nearest neighbors

Question 15

Complete

Mark 1.00 out of 1.00

Which statement best describes Gradient Boosting?

- ☐ a. It averages independent models to reduce variance
- ☒ b. It sequentially adds models that correct residual errors
- ☐ c. It combines models that predict misclassified labels
- ☐ d. It reduces dimensionality before modeling