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Course Content

Weekly Quiz 2 - Boosting

Type	:	Graded Quiz
Attempts	:	1/1
Questions	:	10
Time	:	45m
Due Date	:	Aug 05, 3:30 AM EDT
Your Marks	:	10/10

Instructions

Attempt History

Attempt #1
Aug 04, 5:22 PM

Marks: 10

Q No: 1 Correct Answer

Marks: 1/1

Which of the following statement(s) is/are true for bagging and boosting?

A) Bagging: Weak learners are built in parallel
Boosting: Weak learners are built in sequence one after the other

B) Bagging: More weight to those weak learners with better performance
Boosting: Each weak learner has equal weight in the final prediction.

C) Bagging: Samples are drawn from the original dataset with replacement to train each individual weak learner
Boosting: Subsequent samples have more weight of those observations which had relatively higher errors in previous weak learners

D) Bagging: Random forest is a special type of bagging technique
Boosting: Adaboost is a special type of boosting technique

- ○ A, B, and C
- ○ B, C, and D
- ◉ A, C, and D — You Selected
- ○ A and D

In bagging, weak learners are built in parallel, and samples are drawn from the original dataset with replacement to train each individual weak learner. Example - Random Forest

In boosting, weak learners are built in sequence one after the other, and subsequent samples have more weight of those observations which had relatively higher errors in previous weak learners. Example - Adaboost

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Q No: 2 Correct Answer

Marks: 1/1

Which of the following statement(s) is/are true about the Gradient Boosting trees?

1. Gradient Boosting trees work on residuals instead of changing the weights of observations.
2. By fitting new models to the residuals, the overall learner gradually improves in areas where residuals are initially high.

- (●) 1 and 2 — You Selected
- ( ) Only 1
- ( ) Only 2
- ( ) None

Gradient boosting trees work by fitting new models to the residuals and thereby gradually improving the overall learner in areas where residuals are initially high.

Q No: 3 Correct Answer

Marks: 1/1

Alpha is a hyperparameter that is used while changing the weights of the samples in an AdaBoost model.

Which of the following statement(s) is/are correct?

A) The weight of a sample is decreased if it is incorrectly classified by the previous weak learner.

B) The weight of a sample is increased if it is incorrectly classified by the previous weak learner.

C) The alpha can be both positive or negative

D) The alpha cannot be negative

- ( ) Only A
- ( ) A and B
- (●) B and C — You Selected
- ( ) Only D

The weight of a sample is increased if it is incorrectly classified by the previous weak learner. Depending on whether the weight should be increased or decreased, the alpha can be both positive or negative.

Q No: 4 Correct Answer

Marks: 1/1

What is the correct sequence of steps for the gradient boosting algorithm?
A. Calculate the residual for each observation.
B. Update all predictions using previous probabilities and new output values
C. Initialize the model with an initial prediction for all observations
D. Repeat steps by creating a new tree until the maximum number of estimators is reached
E. Build a tree and calculate the output value for each leaf node

- ○ A → B → C - > D → E
- ○ B → C→ E→ D→ A
- ○ C → A → B → D → E
- ◉ C → A → E → B → D — You Selected

The correct sequence -

Initialize the model with an initial prediction for all observations.

Calculate the residual for each observation.

Build a tree and calculate the output value for each leaf node.

Update all predictions using previous probabilities and new output values.

Repeat steps by creating a new tree until the maximum number of estimators is reached.

Q No: 5 Correct Answer

Marks: 1/1

Which of the following algorithms do NOT have a 'learning rate' parameter/hyperparameter?

- ○ Gradient Boosting
- ○ XGBoost
- ◉ Random Forest — You Selected
- ○ All of these

Gradient Boosting and XGBoost are similar algorithms and have a 'learning rate' parameter/hyperparameter to reduce overfitting.

Q No: 6 Correct Answer

Marks: 1/1

Which hyperparameter of XGBoost can be used to deal with the imbalance in data?

- gamma
- learning_rate
- scale_pos_weight — You Selected
- colsample_by_node

In XGBoost, scale_pos_weight controls the balance of positive and negative weights and is used to deal with imbalanced classes.

Q No: 7 Correct Answer

Marks: 1/1

Which of the following statements is false about XGBoost?

- XGBoost is a boosting technique
- XGBoost builds upon the idea of gradient boosting algorithm with some modifications
- It provides features that help in better computing like parallelization, cache optimization, out of core computing and distributed computing
- XGBoost cannot handle missing values internally — You Selected

XGBoost has the ability to handle missing values internally.

Q No: 8 Correct Answer

Marks: 1/1

Which of the following statement(s) is/are correct for boosting technique?

A) Weight of observation, to be selected while building the next weak learner, increases if the observation is correctly classified

B) Weight of observation, to be selected while building the next weak learner, increases, if the observation is incorrectly classified

C) Weight of observation, to be selected while building the next weak learner, decreases if the observation is correctly classified

D) Weight of observation, to be selected while building the next weak learner, decreases if the observation is incorrectly classified

- A and B
- B and C — You Selected
- C and D
- A and D

Weight of observation, to be selected while building the next weak learner, increases, if the observation is incorrectly classified, and the weight decreases if the observation is correctly classified.

Q No: 9 Correct Answer

Marks: 1/1

Adaboost takes a weighted voting/weighted average of the weak learners for the final prediction.

- (●) True — You Selected
- ( ) False

Adaboost takes a weighted voting/weighted average of the weak learners for the final prediction.

Q No: 10 Correct Answer

Marks: 1/1

Which of the following is/are true:

1. Bagging and boosting use heterogeneous learners (different algorithms as different weak learners).

2. Stacking is a homogeneous model.

- ( ) Only 1
- ( ) Only 2
- ( ) Both 1 and 2
- (●) None — You Selected

Bagging and boosting use homogenous models while stacking uses heterogeneous models.

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