Home Dashboard My courses Edit mode [Completed ☑] [16-12-2024]\_AI249 \_Second\_FirstSemester\_2025-2024 / New section (الجلسة 1: تعلم الآلة (الشعب 1 (الجلسة 1: تعلم الآلة (الشعب 1 Settings Question bank Quiz Questions Results More ~ Status Finished Started Monday, 16 December 2024, 10:59 AM Completed Monday, 16 December 2024, 11:28 AM **Duration** 28 mins 40 secs **Grade 15.00** out of 16.00 (**93.75**%) Question 1 Assume you have a linear regression model with parameters m = 1 and b = 2. You process the data point (2, 5) using Stochastic Gradient Descent with a learning rate Partially of 0.1. What are the updated values of m and b after one step of SGD? correct In linear regression, the common loss function used is the Mean Squared Error (MSE), but for Stochastic Gradient Descent, we look at the contribution of one data Mark 5.00 out point. The loss for one data point can be defined as: of 6.00  $Loss = (Y - Y_pred)^2$ ▼ Flag question **Gradient with respect to (m) (slope): \$** Edit The gradient (dL/dm) is calculated as follows: question dL/dm = -2 \* Error \* Xv2 (latest) Where: Error = Y - Y\_pred • X is the input feature for which we are calculating the gradient. **Gradient with respect to (b) (intercept):** The gradient (dL/db) is simpler and is calculated as: dL/db = -2 \* Error1- Calculate the predicted value: Y\_pred = 4 2- Calculate the error: Error = 1 3- Calculate gradients: Gradient with respect to (m) (slope): -4 Gradient with respect to (b) (intercept): -2 4- Update parameters: the new m = |4.4| × the new b = 2.2 1 | 2.2 | 16 | 4.4 | 1.4 | -2 | 4 | 20 | -4 Your answer is partially correct. You have correctly selected 5. The correct answer is: Assume you have a linear regression model with parameters m = 1 and b = 2. You process the data point (2, 5) using Stochastic Gradient Descent with a learning rate of 0.1. What are the updated values of m and b after one step of SGD? In linear regression, the common loss function used is the Mean Squared Error (MSE), but for Stochastic Gradient Descent, we look at the contribution of one data point. The loss for one data point can be defined as: Loss =  $(Y - Y_pred)^2$ **Gradient with respect to (m) (slope):** The gradient (dL/dm) is calculated as follows: dL/dm = -2 \* Error \* XWhere: • Error = Y - Y\_pred • X is the input feature for which we are calculating the gradient. **Gradient with respect to (b) (intercept):** The gradient (dL/db) is simpler and is calculated as: dL/db = -2 \* Error1- Calculate the predicted value: Y\_pred = [4] 2- Calculate the error: Error =[1] 3- Calculate gradients: Gradient with respect to (m) (slope): [-4] **Gradient with respect to (b) (intercept): [-2]** 4- Update parameters: the new m = [1.4]the new b = [2.2]Make comment or override mark **Response history** Time Step **Action** Marks State 16/12/24, 10:59:23 Not yet answered 1 Started 2 16/12/24, 11:25:47 Saved: {4} {1} {-4} {-2} {4.4} Answer saved {2.2} **Attempt finished Partially correct** 16/12/24, 11:28:03 5.00 3 Question 2 Which of the following classification metrics is also known as the harmonic mean of precision and recall? Correct Mark 1.00 out ● a. F1 Score ✓ of 1.00 b. Specificity Remove flag c. Accuracy **‡** Edit question d. AUC-ROC v1 (latest) Your answer is correct. The correct answer is: F1 Score Make comment or override mark **Response history** Time **Action** Marks Step State 16/12/24, 10:59:23 Not yet answered Started 16/12/24, 11:00:02 Saved: F1 Score 2 Answer saved **Attempt finished** 3 16/12/24, 11:28:03 Correct 1.00 Question 3 **Mean Squared Error (MSE) is calculated as:** Correct Mark 1.00 out a. Average of squared errors of 1.00 ● b. Sum of squared errors divided by sample size and Average of squared errors Remove flag c. Sum of squared errors divided by sample size **\$** Edit question d. Average of absolute errors v1 (latest) Your answer is correct. The correct answer is: Sum of squared errors divided by sample size and Average of squared errors Make comment or override mark **Response history** Step Time Action State **Marks** Not yet answered 16/12/24, 10:59:23 1 Started 2 16/12/24, 11:00:55 Saved: Average of squared Answer saved errors 16/12/24, 11:12:40 Saved: Sum of squared errors 3 Answer saved divided by sample size and Average of squared errors **Attempt finished** 16/12/24, 11:28:03 1.00 4 Correct Question 4 The main function of the gradient descent algorithm is to: Correct Mark 1.00 out a. Calculate the variance

of 1.00

Flag question

**‡** Edit

question

v1 (latest)

Question 5

Mark 1.00 out

Correct

of 1.00

**p** Edit

question

v1 (latest)

Question 6

Mark 1.00 out

Remove flag

Correct

of 1.00

Edit question

v1 (latest)

Question 7

Mark 1.00 out

Correct

of 1.00

Edit question

v1 (latest)

Question 8

Mark 1.00 out

Correct

of 1.00

**\$** Edit

question

v1 (latest)

Question 9

Mark 1.00 out

Remove flag

Correct

of 1.00

Edit question

v1 (latest)

b. Maximize the loss function

● d. Minimize the loss function ✓

The correct answer is: Minimize the loss function

Time

Time

In Naive Bayes classifiers, the term "naive" indicates that:

The correct answer is: Assumes independence among features

Time

16/12/24, 10:59:23

16/12/24, 11:08:03

16/12/24, 11:28:03

Gradient descent updates the weights in the direction of the [Negative] gradient of the loss function.

Gradient descent updates the weights in the direction of the Negative

Time

In a confusion matrix, True Negatives (TN) are defined as:

a. Incorrectly predicted negative cases

b. Incorrectly predicted positive cases

c. Correctly predicted positive cases

● d. Correctly predicted negative cases ✓

Recall is also known as the | true positive | <

true negative

Recall is also known as the [true positive] rate.

The correct answer is: Correctly predicted negative cases

Time

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16/12/24, 11:04:10

16/12/24, 11:28:03

F1 score

Time

In the context of bias-variance tradeoff, high bias typically results in:

Time

Precision

Time

16/12/24, 10:59:23

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16/12/24, 11:28:03

16/12/24, 10:59:23

16/12/24, 11:05:12

16/12/24, 11:28:03

16/12/24, 10:59:23

16/12/24, 11:04:56

16/12/24, 11:09:16

16/12/24, 11:16:06

16/12/24, 11:28:03

rate.

Your answer is correct.

**Response history** 

Your answer is correct.

The correct answer is:

**Response history** 

a. Overfitting

b. Increased variance

c. A balanced model

d. Underfitting

Your answer is correct.

**Response history** 

Your answer is correct.

The correct answer is:

**Response history** 

Step

1

2

3

Make comment or override mark

Step

1

2

3

The correct answer is: Underfitting

Make comment or override mark

Step

2

3

4

5

Question 10

Mark 1.00 out

Correct

of 1.00

**‡** Edit

question

v1 (latest)

Question 11

Mark 1.00 out

Correct

of 1.00

Edit question

v1 (latest)

Make comment or override mark

Step

1

2

3

Make comment or override mark

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a. It can classify only binary data

d. The classifier is less accurate

● c. Assumes independence among features ✓

b. It's easy to implement

Your answer is correct.

**Response history** 

Step

1

2

3

Make comment or override mark

Positive

Your answer is correct.

The correct answer is:

**Response history** 

Step

1

2

3

Make comment or override mark

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16/12/24, 10:59:23

16/12/24, 11:01:04

16/12/24, 11:28:03

**Action** 

Started

function

If a confusion matrix shows: True Positives = 50, False Positives = 10, True Negatives = 30, and False Negatives = 5, what is the precision?

**Action** 

Started

**Action** 

Started

Action

Started

**Action** 

Started

**Action** 

Started

Saved: {\$a}

**Action** 

Started

The term generalization error  $\checkmark$  refers to the error of the model when predicting new data that it has not seen before.

The term [generalization error] refers to the error of the model when predicting new data that it has not seen before.

**Action** 

Started

Saved: {generalization error}

**Attempt finished** 

Recall

Saved: Underfitting

**Attempt finished** 

Saved: {true positive}

Saved: {true positive}

**Attempt finished** 

negative cases

**Attempt finished** 

Saved: Correctly predicted

Saved: {Negative}

**Attempt finished** 

Saved: Assumes

**Attempt finished** 

independence among features

Saved: 0.83

**Attempt finished** 

Saved: Minimize the loss

**Attempt finished** 

State

Not yet answered

Answer saved

Correct

State

Not yet answered

Answer saved

Correct

**State** 

Not yet answered

Answer saved

Correct

State

Not yet answered

Answer saved

Correct

State

Not yet answered

Answer saved

Correct

State

Not yet answered

Not yet answered

Answer saved

Answer saved

Correct

**State** 

Not yet answered

Answer saved

Correct

State

Not yet answered

Answer saved

Correct

gradient of the loss function.

Marks

1.00

Marks

1.00

Marks

1.00

Marks

1.00

**Marks** 

1.00

**Marks** 

1.00

Marks

1.00

Marks

1.00

Finish review

c. Estimate the bias

Your answer is correct.

**Response history** 

Step

3

a. 0.90

● b. 0.83 ✓

c. 0.87

d. 0.75

Your answer is correct.

**Response history** 

Step

2

3

The correct answer is: 0.83

Make comment or override mark

Make comment or override mark