Your grade: 96%

Your latest: **96%** • Your highest: **96%** • To pass you need at least 80%. We keep your highest score.

Next item

1. Which of the following best describes the trade-off between bias and variance in machine learning models? 1 / 1 point

- ○ Low bias and low variance lead to underfitting, while high bias and high variance lead to overfitting.
- ○ Bias and variance do not affect model performance.
- ◉ High bias and low variance lead to underfitting, while low bias and high variance lead to overfitting.
- ○ High bias and high variance both lead to overfitting.

Correct
Correct! High bias can cause the model to miss relevant relations between features and target outputs (underfitting), while high variance can cause the model to model the random noise in the training data (overfitting).

2. Which of the following are signs of a model that is overfitting? 1 / 1 point

- ☐ The model performs equally well on both training and validation data.
- ☑ The model performs well on training data but poorly on validation data.

Correct
Correct! Overfitting occurs when the model captures noise in the training data, leading to poor performance on validation data.

- ☐ The model's performance improves as more noise is added to the training data.
- ☑ The model has high variance.

Correct
Right! High variance indicates that the model is sensitive to fluctuations in the training data, a common sign of overfitting.

3. Which of the following tasks are essential steps in implementing a neural network from scratch using NumPy? 0.8 / 1 point

- ☑ Calculating the dot product between input and weight vectors

Correct
Great job! Calculating the dot product is crucial in the forward pass of the neural network.

- ☑ Initializing weights and biases

Correct
Correct! Initializing weights and biases is a critical step in building a neural network.

- ☑ Preprocessing and scaling training data

This should not be selected
Try again. While preprocessing is important, it is not part of the core steps when implementing a network from scratch using NumPy.

- ☐ Using pre-built functions from deep learning libraries like TensorFlow
- ☑ Implementing the forward and backward passes

Correct
Correct! Implementing both forward and backward passes is essential for training the neural network.

4. Which of the following steps are part of performing a complete backward pass in a neural network? 1 / 1 point

- ☑ Compute the derivative of the activation function

Correct
Correct! Computing the derivative of the activation function is an important part of the backward pass.

- ☐ Initialize weights and biases
- ☑ Update the weights using the calculated gradients and the learning rate

Correct
Correct! Updating the weights using the gradients and learning rate is essential during the backward pass.

- ☐ Preprocess and scale training data
- ☐ Calculate the dot product of the input and weights
- ☑ Calculate the gradient of the loss with respect to each weight

Correct
Correct! Calculating the gradient of the loss with respect to each weight is a crucial step in the backward pass.

5. What is the primary purpose of the forward pass in a neural network? 1 / 1 point

- ○ To initialize the network parameters
- ○ To update the weights and biases of the network
- ○ To evaluate the network's accuracy
- ◉ To calculate the output of the network

Correct
Correct! The primary purpose of the forward pass is to compute the network's output based on the input data and the current weights and biases.