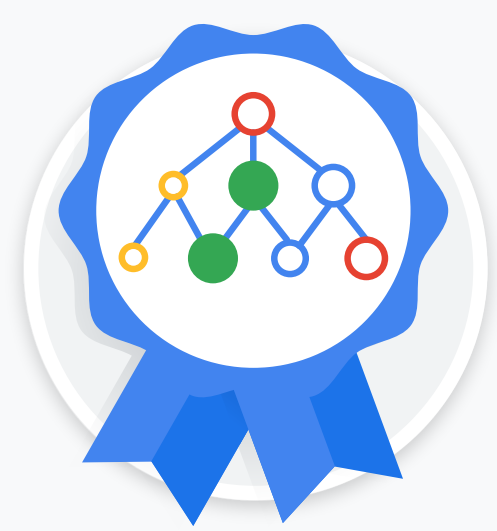


Neural Networks: Test Your Knowledge

Let's do a quick test! You must answer at least 4 questions correctly to pass this quiz.



1. Fill in the blank in the following sentence:

Neural network models can automatically learn ___ during training.

- ☐ Activation functions
- ☐ Hyperparameters
- ☒ Nonlinear feature interactions
- ☐ The loss function

Neural networks can automatically learn nonlinear relationships between features during training.

2. Evaluate this expression: $\text{ReLU}(-3)$

- ☐ -3
- ☒ 0
- ☐ 3
- ☐ 9

When the input to the ReLU function is a negative number, the output is 0.

3. Fill in the blank in the following sentence:

A linear model is commonly trained using gradient descent. Neural networks additionally also use the ___ algorithm.

- ☐ Sigmoid
- ☐ Hidden layers
- ☐ Activation functions
- ☒ Backpropagation

Backpropagation is the most common algorithm used to train neural networks.

4. True or False: Lowering the learning rate can help prevent exploding gradients during neural network training.

- ☒ True
- ☐ False

Lowering the learning rate is indeed a strategy that can be effective in preventing exploding gradients. It can also help prevent dead ReLU units.

5. You are training an image classifier model to predict a dog's breed(s) from a photo of the dog, using a list of pure-breed classes provided by the international [FCI breed registry](#). The model should successfully classify both pure-breed dogs and mixed-breed dogs. Which type of classification model should you use?

- ☐ Binary classification
- ☒ One-vs.-all
- ☐ One-vs.-one (multi-class with softmax)
- ☐ None of the above

One-vs.-all is a good choice here, as it will independently predict a probability for each possible class (dog breed). For cases where a dog is mixed-breed (e.g., half-labrador, half-poodle), this configuration will enable the model to predict high probabilities for both breeds (e.g., 75% likelihood of being a labrador, and 85% likelihood of being a poodle). By contrast, a one-vs.one (softmax) model would require the probabilities for each class to sum to 100%, which would mean that the higher the probability the model predicts for "labrador," the lower the probability the model predicts for "poodle" (and any other breed).

Results

You scored **5 out of 5**. Congratulations! You have passed this quiz.

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