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
  - ✓ Neural networks can automatically learn nonlinear relationships between features during training.
- ○ The loss function

2. Evaluate this expression: `ReLU(−3)`

- ○ −3
- ◉ 0
  - ✓ When the input to the ReLU function is a negative number, the output is 0.
- ○ 3
- ○ 9

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

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.-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).
- ○ One-vs.-one (multi-class with softmax)
- ○ None of the above

Results

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

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Machine Learning Crash Course: Neural networks!

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