

1. True or False questions:

- During forward propagation, in the forward function for a layer l you need to know what is the activation function in a layer (Sigmoid, tanh, ReLU, etc.). During backpropagation, the corresponding backward function also needs to know what is the activation function for layer l , since the gradient depends on it.
- The deeper layers of a neural network are typically computing more complex features of the input than the earlier layers.

Answer:

2. Among the following, which ones are "hyperparameters"?

- a) size of the hidden layers
- b) learning rate
- c) number of iterations
- d) number of layers in the neural network

Answer:

3. Which is NOT true about gradient descent?

- a) Gradient descent is to find the values of a function's parameters that minimize a cost function as far as possible.
- b) When maximizing an objective function, you can use gradient ascent instead of gradient descent.
- c) Gradient descent is a specific design method for neural network optimization.
- d) Stochastic gradient descent is a variant of the gradient descent method that is popular for neural networks training.

Answer:

4. Consider a neural network with 2 hidden layers, each of which can be represented by $y_i = \sigma(x_{i-1}W_i + b_i)$, if the input of the neural network $x_0 \in \mathbb{R}^{16 \times 1}$, the input of the second hidden layer $x_1 \in \mathbb{R}^{32 \times 1}$, and the output of the second hidden layer $y_2 \in \mathbb{R}^{16 \times 1}$, which of the following statements are True (check all that apply)?

- W_1 will have shape (16, 16)
- b_1 will have shape (16, 1)
- y_1 will have shape (32, 1)
- W_2 will have shape (32, 1)
- b_2 will have shape (16, 1)

Answer:

5. Why is zero initialization of weight, not a good initialization technique?

Answer:

6. Why data normalization is needed in most cases of deep learning models?

Answer:

7. Why is ReLU the most commonly used Activation Function?

Answer:

8. Explain the vanishing and exploding gradient problems.

Answer:

9. What is the difference between Epoch, Batch, and Iteration in Neural Networks?

Answer:

10. List 5 scenarios that you want to use FNN to solve a transportation related problem.

Answer:

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