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NPTEL (https://swayam.gov.in/explorer?ncCode=NPTEL) » Deep Learning - IIT Ropar (course)

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Week 2 : Assignment 2

The due date for submitting this assignment has passed.

Due on 2024-08-07, 23:59 IST.

As per our records you have not submitted this assignment.

1) Which of the following statements is(are) true about the following function? ***1 point***

$\sigma(z) = \frac{1}{1+e^{-(z)}}$

- [ ] The function is bounded between 0 and 1
- [ ] The function attains its maximum when $z \to \infty$
- [ ] The function is continuously differentiable
- [ ] The function is monotonic

No, the answer is incorrect.

Score: 0

Accepted Answers:

The function is bounded between 0 and 1

The function attains its maximum when $z \to \infty$

The function is continuously differentiable

The function is monotonic

2) How many weights does a neural network have if it consists of an input layer with 2 neurons, three hidden layers each with 4 neurons, and an output layer with 2 neurons? Assume there are no bias terms in the network.

No, the answer is incorrect.
Score: 0

Accepted Answers:

(Type: Numeric) 48

1 point

3) Suppose we have a Multi-layer Perceptron with an input layer, one hidden layer and an output layer. The hidden layer contains 64 perceptrons. The output layer contains one perceptron. Choose the statement(s) that are true about the network. ***1 point***

- The network is capable of implementing 2^6 Boolean functions
- The network is capable of implementing 2^{64} Boolean functions
- Each perceptron in the hidden layer can take in only 64 Boolean inputs
- Each perceptron in the hidden layer can take in only 6 Boolean inputs

No, the answer is incorrect.
Score: 0

Accepted Answers:

The network is capable of implementing 2^{64} Boolean functions

4) Consider a function $f(x) = x^3 - 4x^2 + 7$. What is the updated value of x after 2nd iteration of the gradient descent update, if the

learning rate is 0.1 and the initial value of x is 5?

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 2.0,2.1

1 point

5) You are training a model using the gradient descent algorithm and notice that the loss decreases and then increases after each successive epoch (pass through the data). Which of the following techniques would you employ to enhance the likelihood of the gradient descent algorithm converging? (Here, η refers to the step size.) ***1 point***

- Decrease the value of η
- Increase the value of η
- Set $\eta = 1$
- Set $\eta = 0$

No, the answer is incorrect.
Score: 0
Accepted Answers:
Increase the value of η

6) Which of the following statements is true about the representation power of a multilayer network of perceptions? ***1 point***

- A multilayer network of perceptrons can represent any function.
- A multilayer network of perceptrons can represent any linear function.
- A multilayer network of perceptrons can represent any boolean function.

A multilayer network of perceptrons can represent any continuous function.

No, the answer is incorrect.
Score: 0
Accepted Answers:
A multilayer network of perceptrons can represent any boolean function.

7) How many boolean functions can be designed for 4 inputs? ***1 point***

- 65,536
- 8
- 256
- 64

No, the answer is incorrect.
Score: 0
Accepted Answers:
65,536

8) How many neurons do you need in the hidden layer of a perceptron to learn any boolean function with 4 inputs? (Only one hidden layer is allowed) ***1 point***

- 16
- 64
- 56
- 32

No, the answer is incorrect.
Score: 0
Accepted Answers:
16

9) We have a classification problem with labels 0 and 1. We train a logistic model and find out that ω_0 learned by our model is -17. We are to predict the label of a new test point x using this trained model. If $\omega^T x = 1$, which of the following statements is True? ***1 point***

We cannot make any prediction as the value of $\omega^T x$ does not make sense

The label of the test point is 0.

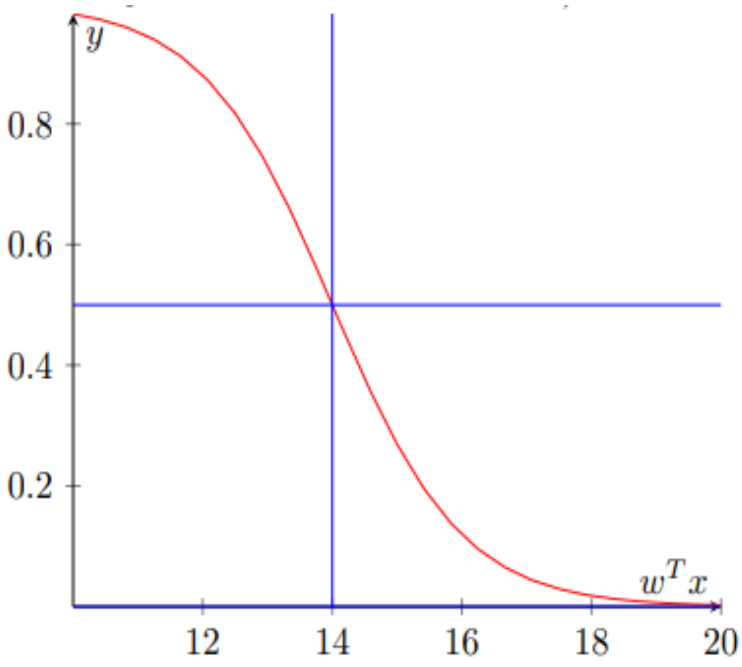
The label of the test point is 1.

We cannot make any prediction as we do not know the value of x.

No, the answer is incorrect.
Score: 0

Accepted Answers:
The label of the test point is 0.

10)The diagram given below is a section of the sigmoid function given by $y = \frac{1}{1+e^{-(\omega_0+\omega^T x)}}$. Which of the following statements is true with respect to the given diagram? (Blue lines denotes $y = 0.5$ line and $\omega^T x = 14$ line) ***1 point***



$\omega_0 = 14$

$\omega_0 = -14$

$\omega > 0$

$\omega < 0$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\omega_0 = -14$