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Week 5 : Assignment 5

The due date for submitting this assignment has passed.
Due on 2022-03-02, 23:59 IST.

Assignment submitted on 2022-03-02, 23:03 IST

1) ***2 points***

Suppose a fully-connected neural network has a single hidden layer with 30 nodes. The input is represented by a 3D feature vector and we have a binary classification problem. Calculate the number of parameters of the network. Consider there are NO bias nodes in the network.

a. 100
b. 120
c. 140
d. 125

- ○ a.
- ○ b.
- ◉ c.
- ○ d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

2) ***2 points***

For a binary classification setting, if the probability of belonging to class= +1 is 0.22, what is the probability of belonging to class= -1 ?

a. 0
b. 0.22
c. 0.78
d. -0.22

- ○ a.
- ○ b.
- ◉ c.
- ○ d.

Yes, the answer is correct.
Score: 2

Accepted Answers:
c.

3) ***2 points***

Input to SoftMax activation function is [2,4,6]. What will be the output?

a. [0.11,0.78,0.11]
b. [0.016,0.117, 0.867]
c. [0.045,0.910,0.045]
d. [0.21, 0.58,0.21]

- ○ a.
- ◉ b.
- ○ c.
- ○ d.

Yes, the answer is correct.
Score: 2

Accepted Answers:
b.

4) ***2 points***

A 3-input neuron has weights 1, 0.5, 2. The transfer function is linear, with the constant of proportionality being equal to 2. The inputs are 2, 20, 4 respectively. The output will be:

a. 40
b. 20
c. 80
d. 10

- ◉ a.
- ○ b.
- ○ c.

d.

Yes, the answer is correct.
Score: 2

Accepted Answers:
a.

5) ***2 points***

Which one of the following activation functions is NOT analytically differentiable for all real values of the given input?

a. Sigmoid
b. Tanh
c. ReLU
d. None of the above

a.
b.
c.
d.

Yes, the answer is correct.
Score: 2

Accepted Answers:
c.

6) ***0 points***

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Week 12 : ()

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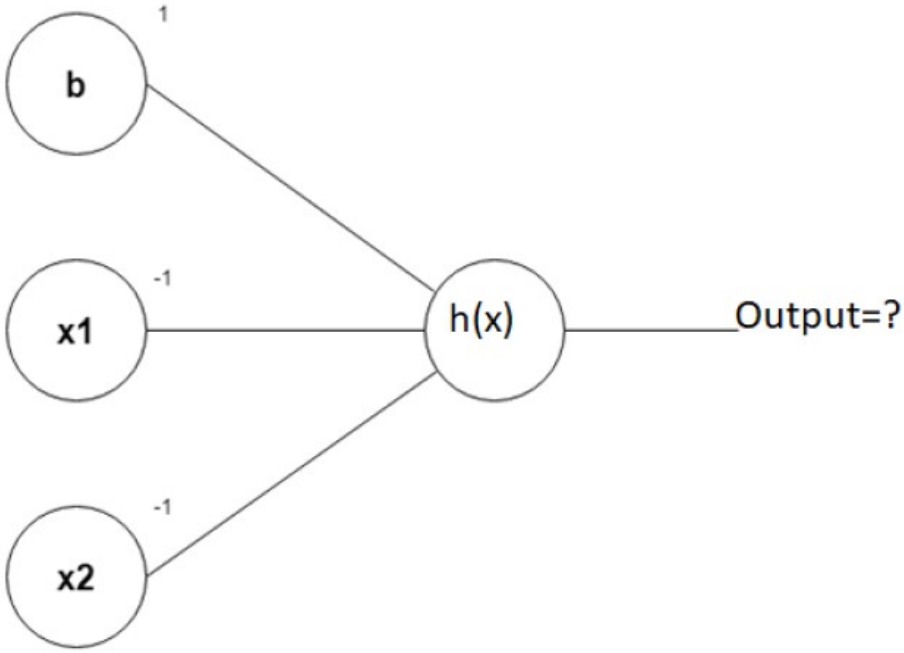
Which function do the following perceptron realize? X1 and x2 can take only binary values. h(x) is the activation function. $h(x) = 1$ if $x > 0$, else 0.



a. NAND
b. NOR
c. AND
d. OR

- (●) a.
- ( ) b.
- ( ) c.
- ( ) d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

7) ***2 points***

In a simple MLP model with 10 neurons in the input layer, 100 neurons in the hidden layer and 1 neuron in the output layer. What is the size of the weight matrices between hidden output layer and input hidden layer?

a. [10x1] , [100 X 2]

b. [100x1] , [10 X 1]

c. [100 x 10], [10 x 1]

d. [100x 1] , [10 x 100]

- ○ a.
- ○ b.
- ○ c.
- ◉ d.

Yes, the answer is correct.
Score: 2

Accepted Answers:
d.

8) ***2 points***

Consider a fully connected neural network with input, one hidden layer, and output layer with 40, 2, 1 nodes respectively in each layer. What is the total number of learnable parameters (no biases)?

a. 2
b. 82
c. 80
d. 40

- ○ a.
- ◉ b.
- ○ c.
- ○ d.

Yes, the answer is correct.
Score: 2

Accepted Answers:
b.

9) ***2 points***

You want to build a 10-class neural network classifier, given a cat image, you want to classify which of the 10 cat breeds it belongs to. Which among the 4 options would be an appropriate loss function to use for this task?

a. Cross Entropy Loss
b. MSE Loss
c. SSIM Loss
d. None of the above

- (●) a.
- ( ) b.
- ( ) c.
- ( ) d.

Yes, the answer is correct.
Score: 2

Accepted Answers:
a.

10) ***2 points***

You'd like to train a fully-connected neural network with 5 hidden layers, each with 10 hidden units. The input is 20-dimensional and the output is a scalar. What is the total number of trainable parameters in your network? There is no bias.

a. (20+1)*10 + (10+1)*10*4 + (10+1)*1
b. (20)*10 + (10)*10*4 + (10)*1
c. (20)*10 + (10)*10*5 + (10)*1
d. (20+1)*10 + (10+1)*10*5 + (10+1)*1

- (●) a.
- ( ) b.
- ( ) c.
- ( ) d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.