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Week 8 : Assignment 8

The due date for submitting this assignment has passed.

Due on 2024-09-18, 23:59 IST.

Assignment submitted on 2024-09-18, 18:37 IST

1) Which of the following activation functions is not zero-centered? ***1 point***

- [x] Sigmoid
- [ ] Tanh
- [x] ReLU
- [x] Softmax

Yes, the answer is correct.
Score: 1
Accepted Answers:
Sigmoid
ReLU
Softmax

2) We have observed that the sigmoid neuron has become saturated. What might be the possible output values at this neuron? ***1 point***

- [x] 0.02
- [ ] 0.5
- [x] 1
- [x] 0.97

Yes, the answer is correct.
Score: 1
Accepted Answers:
0.02
1
0.97

3) What is the gradient of the sigmoid function at saturation?

0

Yes, the answer is correct.
Score: 1
Accepted Answers:
(Type: Numeric) 0

1 point

4) Which of the following are common issues caused by saturating neurons in deep networks? ***1 point***

- [x] Vanishing gradients
- [x] Slow convergence during training
- [ ] Overfitting
- [ ] Increased model complexity

Yes, the answer is correct.
Score: 1
Accepted Answers:
Vanishing gradients
Slow convergence during training

5) What are the challenges associated with using the Tanh(x) activation function? ***1 point***

- [ ] It is not zero centered
- [x] Computationally expensive
- [ ] Non-differentiable at 0
- [x] Saturation

Yes, the answer is correct.
Score: 1
Accepted Answers:
Computationally expensive
Saturation

6) We train a feed-forward neural network and notice that all the weights for a particular neuron are equal. What could be the possible causes of this issue? ***1 point***

- [ ] Weights were initialized randomly
- [ ] Weights were initialized to high values
- [x] Weights were initialized to equal values
- [x] Weights were initialized to zero

Yes, the answer is correct.
Score: 1
Accepted Answers:
Weights were initialized to equal values
Weights were initialized to zero

7) What is the main cause of the Dead ReLU problem in deep learning? ***1 point***

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- High variance
- High negative bias
- Overfitting
- Underfitting

Yes, the answer is correct.
Score: 1

Accepted Answers:
High negative bias

8) How can you tell if your network is suffering from the Dead ReLU problem? ***1 point***

- The loss function is not decreasing during training
- The accuracy of the network is not improving
- A large number of neurons have zero output
- The network is overfitting to the training data

Yes, the answer is correct.
Score: 1

Accepted Answers:
A large number of neurons have zero output

9) What is the mathematical expression for the ReLU activation function? ***1 point***

- f(x) = x if x $<$ 0, 0 otherwise
- f(x) = 0 if x $>$ 0, x otherwise
- f(x) = max(0,x)
- f(x) = min(0,x)

Yes, the answer is correct.
Score: 1

Accepted Answers:
f(x) = max(0,x)

10) What is the main cause of the symmetry breaking problem in deep learning? ***1 point***

- High variance
- High bias
- Overfitting
- Equal initialization of weights

Yes, the answer is correct.
Score: 1

Accepted Answers:
Equal initialization of weights