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NPTEL (<https://swayam.gov.in/explorer?ncCode=NPTEL>) » Deep Learning - IIT Ropar (course)Course  
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NPTEL ()How does an  
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☐ A quick recap  
of training  
deep neural  
networks  
(unit?)

## 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

- ☒ Sigmoid
- ☐ Tanh
- ☒ ReLU
- ☒ 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

- ☒ 0.02
- ☐ 0.5
- ☒ 1
- ☒ 0.97

Yes, the answer is correct.

Score: 1

Accepted Answers:

0.02

1

0.97

unit=107&less  
on=108)

☐ Unsupervised  
pre-training  
(unit?  
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☐ Better  
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☒ **Quiz: Week 8  
: Assignment  
8  
(assessment?  
name=296)**

**Week 9 ()**

**week 10 ()**

**Week 11 ()**

**Week 12 ()**

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**

- ☒ Vanishing gradients
- ☒ 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
- ☒ Computationally expensive
- ☐ Non-differentiable at 0
- ☒ 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
- ☒ Weights were initialized to equal values
- ☒ 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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Solving  
Session -  
July 2024 ()**

- ☐ 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*