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shweta_s@cs.iitr.ac.in ▾

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

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Course outline

About
NPTEL ()

How does an
NPTEL
online
course
work? ()

Week 0 ()

Week 1 ()

Week 2 ()

Week 3 ()

week 4 ()

Week 8 : Assignment 8

The due date for submitting this assignment has passed.

Due on 2025-03-19, 23:59 IST.

Assignment submitted on 2025-03-17, 14:31 IST

1) 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

2) Which of the following problems makes training a neural network harder while using sigmoid as the activation function? 1 point

- ☐ Not-continuous at 0
- ☐ Not-differentiable at 0
- ☒ Saturation
- ☒ Computationally expensive

Yes, the answer is correct.
Score: 1

Accepted Answers:
Saturation
Computationally expensive

3) Consider the Exponential ReLU (ELU) activation function, defined as:

1 point

Week 5 ()

Week 6 ()

Week 7 ()

Week 8 ()

☐ A quick recap of training deep neural networks (unit? unit=107&lesson=108)

☒ Unsupervised pre-training (unit? unit=107&lesson=109)

☒ Better activation functions (unit? unit=107&lesson=110)

☒ Better initialization strategies (unit? unit=107&lesson=111)

☒ Batch Normalization (unit? unit=107&lesson=112)

☒ Lecture Material for Week 8 (unit? unit=107&lesson=113)

☐ Week 8 Feedback Form: Deep Learning - IIT Ropar!! (unit? unit=107&lesson=191)

☒ Week 8: Solution (unit?)

$$f(x) = \begin{cases} x, & x > 0 \\ a(e^x - 1), & x \leq 0 \end{cases}$$

where $a \neq 0$. Which of the following statements is true?

- ☐ The function is discontinuous at $x = 0$.
- ☐ The function is non-differentiable at $x = 0$.
- ☒ Exponential ReLU can produce negative values.
- ☐ Exponential ReLU is computationally less expensive than ReLU.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Exponential ReLU can produce negative values.

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

- ☐ 0.0666
- ☐ 0.589
- ☒ 0.9734
- ☐ 0.498
- ☒ 1

No, the answer is incorrect.

Score: 0

Accepted Answers:

0.0666

0.9734

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

Yes, the answer is correct.

Score: 1

Accepted Answers:

(Type: Numeric) 0

1 point

6) 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

unit=107&less
on=252)

● Quiz: Week 8
: Assignment
8
(assessment?
name=317)

Week 9 ()

week 10 ()

Week 11 ()

Week 12 ()

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Session -
Jan 2025 ()

Slow convergence during training

7) Given a neuron initialized with weights $w_1 = 0.9$, $w_2 = 1.7$, and inputs $x_1 = 0.4$, $x_2 = -0.7$, calculate the output of a ReLU neuron.

0

Yes, the answer is correct.

Score: 1

Accepted Answers:

(Type: Numeric) 0

1 point

8) Which of the following is incorrect with respect to the batch normalization process in neural networks? **0 points**

- ☐ We normalize the output produced at each layer before feeding it into the next layer
- ☐ Batch normalization leads to a better initialization of weights.
- ☐ Backpropagation can be used after batch normalization
- ☒ Variance and mean are not learnable parameters.

Yes, the answer is correct.

Score: 0

Accepted Answers:

Variance and mean are not learnable parameters.

9) Which of the following is an advantage of unsupervised pre-training in deep learning? **1 point**

- ☒ It helps in reducing overfitting
- ☐ Pre-trained models converge faster
- ☐ It requires fewer computational resources
- ☒ It improves the accuracy of the model

Partially Correct.

Score: 0.67

Accepted Answers:

It helps in reducing overfitting

Pre-trained models converge faster

It improves the accuracy of the model

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

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

