

# Unit 9 - Week 7

## Course outline

How does an NPTEL online course work?

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Week 7

Lecture 31 : Autoencoder Training

Lecture 32 : Autoencoder Variants I

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Lecture 34 : Convolution

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## Assignment 7

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2020-03-18, 23:59 IST.

1) What are the advantages of initializing MLP with pre-trained autoencoder weights?

1 point

- a. Faster Convergence & Avoid overfitting
- b. Faster Convergence & Simpler hypothesis
- c. Faster Convergence, Avoid overfitting & Simpler hypothesis
- d. None of these

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

a.

2) A no bias autoencoder consists of 100 input neurons, 50 hidden neurons. If the network weights are represented using single precision floating point numbers then what will be size of weight matrix?

1 point

- a. 10,000 Bytes
- b. 10,150 Bits
- c. 40,000 Bytes
- d. 40,600 Bytes

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

c.

3) A zero-bias autoencoder has 3 input neurons, 1 hidden neuron and 3 output neurons. If the network is perfectly trained using an input  $\begin{bmatrix} 2 \\ 3 \\ 5 \end{bmatrix}$ . What would be the values of encoder and decoder weights respectively?

1 point

- a.  $[1 \ 1 \ 1], \begin{bmatrix} 2 \\ 3 \\ 5 \end{bmatrix}$
- b.  $[1 \ 1 \ 1], \begin{bmatrix} 0.2 \\ 0.3 \\ 0.5 \end{bmatrix}$
- c.  $[0.2 \ 0.3 \ 0.5], \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$
- d.  $[2 \ 3 \ 5], \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

b.

4) Identify the techniques which can be used for training autoencoders

1 point

1. Training one layer at a time
2. Training the encoder first and then the decoder
3. End-to-end training

- a. 1 & 2
- b. 2 & 3
- c. 1 & 3
- d. 1, 2 & 3

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

c.

5) Which of the following autoencoder is not a regularization autoencoder?

1 point

- a. Sparse autoencoder
- b. Denoising autoencoder
- c. Both a and b
- d. Stack autoencoder

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

d.

6) Regularization of Contractive Autoencoder is imposed on

1 point

- a. Activations
- b. Weights
- c. Weights and Activations
- d. Does not use regularization

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

a.

7) Which of the following is not the purpose of cost function in training denoising autoencoders?

1 point

- a. Dimension reduction
- b. Error minimization
- c. Weight Regularization
- d. Image denoising

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

a.

8) What is the KL Divergence between two equal distributions?

1 point

- a. 1
- b.  $+\infty$
- c.  $-\infty$
- d. 0

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

d.

9) Given an input  $I$  to a deep convolutional neural network, where weights of convolution kernels across the  $n$  layers are  $\{w_1, w_2, \dots, w_n\}$ , responses obtained on convolution at each layer are  $\{r_1, r_2, \dots, r_n\}$  and loss at classification being  $L$ , which of the following term updates the weights associated with the first convolutional layer during back-propagation?

1 point

- a.  $\frac{\nabla L}{\nabla r_1}$
- b.  $\frac{\nabla r_2}{\nabla r_1}$
- c.  $\frac{\nabla L}{\nabla w_1}$
- d.  $\frac{\nabla r_2}{\nabla w_1}$

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

c.

10) What is the role of sparsity constraint in a sparse autoencoder?

1 point

- a. Control the number of active nodes in a hidden layer
- b. Control the noise level in a hidden layer
- c. Control the hidden layer length
- d. Not related to sparse autoencoder

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

a.