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NPTEL (<https://swayam.gov.in/explorer?ncCode=NPTEL>) » Deep Learning - IIT Ropar (course)Course
outlineAbout
NPTEL ()How does an
NPTEL
online
course
work? ()

Week 1 ()

Week 2 ()

Week 3 ()

week 4 ()

Week 5 ()

Week 6 ()

● Introduction to
Autoncoders
(unit?
unit=83&lesso
n=84)

● Link between
PCA and
Autoencoders
(unit?

Week 6 : Assignment 6

The due date for submitting this assignment has passed.

Due on 2024-09-04, 23:59 IST.

Assignment submitted on 2024-09-04, 16:21 IST

1) Suppose we build a neural network for a 5-class classification task. Suppose for a single training example, the true label is $[0 \ 1 \ 0 \ 0 \ 1]$ while the predictions by the neural network are $[0.25 \ 0.3 \ 0.2 \ 0.1 \ 0.2]$. What would be the value of cross-entropy loss for this example? (Answer up to two decimal places, Use base 2 for log-related calculations)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: Range) 4.0,4.1

1 point

2) What is/are the primary advantages of Autoencoders over PCA?

1 point

- ☐ Autoencoders are less prone to overfitting than PCA.
- ☐ Autoencoders are faster and more efficient than PCA.
- ☒ Autoencoders can capture nonlinear relationships in the input data.
- ☐ Autoencoders require fewer input data than PCA.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Autoencoders can capture nonlinear relationships in the input data.

3) What type of autoencoder is it when the hidden layer's dimensionality is less than that of the input layer? 1 point

unit=83&lesson=85)

Regularization in autoencoders (Motivation) (unit? unit=83&lesson=86)

Denoising Autoencoders (unit? unit=83&lesson=87)

Sparse Autoencoders (unit? unit=83&lesson=88)

Contractive Autoencoders (unit? unit=83&lesson=89)

Lecture Material for Week 6 (unit? unit=83&lesson=90)

Quiz: Week 6 : Assignment 6 (assessment? name=294)

Week 6 Feedback Form: Deep Learning - IIT Ropar (unit? unit=83&lesson=235)

Week 7 ()

Week 8 ()

Week 9 ()

week 10 ()

Week 11 ()

- ☐ Under-complete autoencoder
- ☐ Complete autoencoder
- ☒ Overcomplete autoencoder
- ☐ Sparse autoencoder

No, the answer is incorrect.
Score: 0

Accepted Answers:

Under-complete autoencoder

4) Which of the following statements about overfitting in overcomplete autoencoders is **1 point** true?

- ☐ Reconstruction error is very low while training
- ☒ Reconstruction error is very high while training
- ☐ Network fails to learn good representations of input
- ☒ Network learns good representations of input

No, the answer is incorrect.
Score: 0

Accepted Answers:

Reconstruction error is very low while training

Network fails to learn good representations of input

5) What are the advantages of using a denoising autoencoder?

1 point

- ☒ Robustness to noisy input data
- ☒ Reduction of the risk of overfitting
- ☐ Faster training time
- ☐ It promotes sparsity in the hidden layer

Yes, the answer is correct.
Score: 1

Accepted Answers:

Robustness to noisy input data

Reduction of the risk of overfitting

6) We are given an autoencoder A. The average activation value of neurons in this network is 0.06. The given autoencoder is:

1 point

- ☐ Contractive autoencoder
- ☐ Overcomplete neural network
- ☒ Sparse autoencoder
- ☐ Denoising autoencoder

Yes, the answer is correct.
Score: 1

Accepted Answers:

Sparse autoencoder

7) What are the possible applications of autoencoders?

0 points

- ☐ Data Compression

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Solving
Session -
July 2024 ()**

- ☐ Extraction of important features
- ☐ Reducing noise
- ☒ All of these

Yes, the answer is correct.

Score: 0

Accepted Answers:

All of these

8) Which of the following problems prevents us from using autoencoders for the task of **1 point**
Image compression?

- ☐ Images are not allowed as input to autoencoders
- ☐ Difficulty in training deep neural networks
- ☒ Loss of image quality due to compression
- ☐ Auto encoders are not capable of producing image output

Yes, the answer is correct.

Score: 1

Accepted Answers:

Loss of image quality due to compression

9) If the dimension of the hidden layer representation is more than the dimension of **1 point**
the input layer, then what kind of autoencoder do we have?

- ☒ Complete autoencoder
- ☐ Under-complete autoencoder
- ☐ Overcomplete autoencoder
- ☐ Sparse autoencoder

No, the answer is incorrect.

Score: 0

Accepted Answers:

Overcomplete autoencoder

10) Suppose for one data point we have features x_1, x_2, x_3, x_4, x_5 as **1 point**
 $-2, 12, 4.2, 7.6, 0$ then, which of the following function should we use on the output
layer(decoder)?

- ☐ Logistic
- ☐ Relu
- ☐ Tanh
- ☒ Linear

Yes, the answer is correct.

Score: 1

Accepted Answers:

Linear

