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

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Week 6: Assignment 6

The due date for submitting this assignment has passed.

Due on 2022-09-07, 23:59 IST.

Assignment submitted on 2022-09-07, 22:14 IST

1) Identify the type of Autoencoder, that limits the amount of information flowing through   **1 point** the network by reducing the number of nodes in hidden layer to learn the most important attributes of the input with minimum reconstruction error from the encoded state.

○ Sparse Autoencoder

○ Overcomplete Autoencoder

◉ Undercomplete Autoencoder

○ Contractive Autoencoder

Yes, the answer is correct.
Score: 1

Accepted Answers:
Undercomplete Autoencoder

2) Consider an autoencoder where the inputs are binary and outputs are also binary.   **1 point** Identify the appropriate function for the encoder.

○ tanh

○ linear

○ Binary step

◉ sigmoid

Yes, the answer is correct.
Score: 1

Accepted Answers:

sigmoid

3)   For an autoencoder where the inputs are real and the interpretation is performed in   **1 point**
terms of real values. Pick out the most appropriate loss function?

⦿ Squared error

◯ Absolute error

◯ Cross entropy

◯ None of the above

Yes, the answer is correct.
Score: 1
Accepted Answers:
Squared error

4)   Select all the characteristics that ensure that an autoencoder is equivalent to PCA.   **1 point**

☑ use linear encoder

☑ use linear decoder

☑ use squared error loss function

☐ use real value input

Yes, the answer is correct.
Score: 1
Accepted Answers:
use linear encoder
use linear decoder
use squared error loss function

5)   You have a model that learns a very complex or flexible model that yields zero error on   **1 point**
training data. Select the options that are possible in this case.

☑ Overfitting has occured

☑ bad performance on unseen data

☐ Underfitting has occured

☐ Will perform good on Unseen data

Yes, the answer is correct.
Score: 1
Accepted Answers:
Overfitting has occured
bad performance on unseen data

6)   Which of the following is True?   **1 point**
Statement I. An overcomplete autoencoder has a large number of parameters which in turn leads to
overfitting.
Statement II. An undercomplete Autoencoder does not require regularization as it shrinks the
number of parameters

⦿ I only

◯ II only

○ Both

○ None

Yes, the answer is correct.
Score: 1
Accepted Answers:
I only

7) Which of the following Autoencoders purposefully corrupts randomly picked input data   **1 point**
to improve the performance?

○ Sparse

○ Contractive
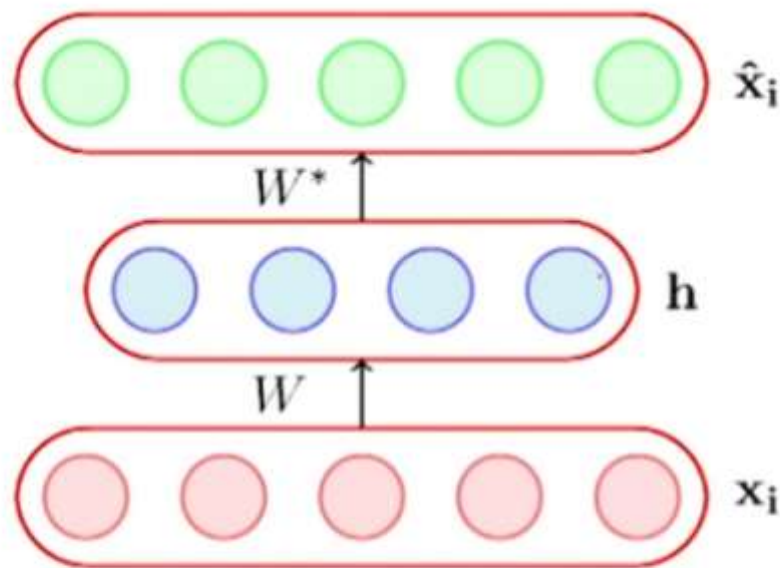
◉ Denoising

○ Overcomplete

○ Undercomplete

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

8) For the given Autoencoder, observe the encoder function. The dimension of input   **1 point**
vector, x_i is $n \times 1$ and dimension of bias is $d \times 1$. What is the dimension of weight w given that
the hidden layer has a dimension d?

$$\mathbf{h} = g(W\mathbf{x_i} + \mathbf{b})$$

○

$d \times d$

○

$d \times n$

○

$n \times d$

○

$d \times 1$

Yes, the answer is correct.
Score: 1

Accepted Answers:
$d \times n$

9) Which of the following statements are True?   **1 point**

S1: L1-regularization enforces sparsity on model weights leading to implicit feature selection. S2:
L2-regularization prevents most weights from taking large values.

○ I only

○ II only

◉ Both

○ None

Yes, the answer is correct.
Score: 1

Accepted Answers:
Both

10) Which of the following statements are TRUE for Sparse Autoencoders?   **1 point**

Statement I. Tries to ensure that the neuron is inactive most of the time.

Statement II. Uses a probabilistic process to corrupt the input data.

◉ Only I

○ Only II

○ Both

○ None

Yes, the answer is correct.
Score: 1

Accepted Answers:
Only I