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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 6 : Assignment 6

**The due date for submitting this assignment has passed.**

**Due on 2025-03-05, 23:59 IST.**

## Assignment submitted on 2025-03-05, 12:25 IST

1) What is/are the primary advantages of Autoencoders over PCA? ***1 point***

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

No, the answer is incorrect.
Score: 0

Accepted Answers:
*Autoencoders can capture nonlinear relationships in the input data.*

2) Which of the following is a potential advantage of using an overcomplete autoencoder? ***1 point***

- ( ) Reduction of the risk of overfitting
- ( ) Faster training time
- (•) Ability to learn more complex and nonlinear representations
- ( ) To compress the input data

Yes, the answer is correct.
Score: 1

Accepted Answers:
*Ability to learn more complex and nonlinear representations*

3) We are given an autoencoder A. The average activation value of neurons in this network is 0.015. The given autoencoder is ***1 point***

- ○ Contractive autoencoder
- ◉ Sparse autoencoder
- ○ Overcomplete neural network
- ○ Denoising autoencoder

Yes, the answer is correct.
Score: 1

Accepted Answers:
*Sparse autoencoder*

4) 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 [0.4 0.25 0.2 0.1 0.6]. 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)

2.737

Yes, the answer is correct.
Score: 1

Accepted Answers:
*(Type: Range) 2.7,2.8*

***1 point***

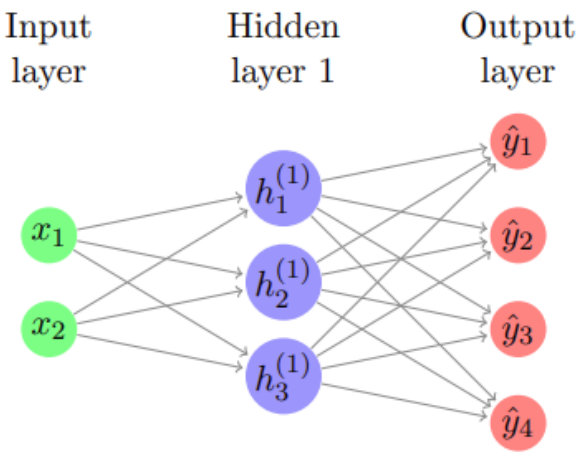
5) If an under-complete autoencoder has an input layer with a dimension of 5, what could be the possible dimension of the hidden layer? ***1 point***

- ☐ 5
- ☑ 4
- ☑ 2
- ☐ 0
- ☐ 6

Yes, the answer is correct.
Score: 1

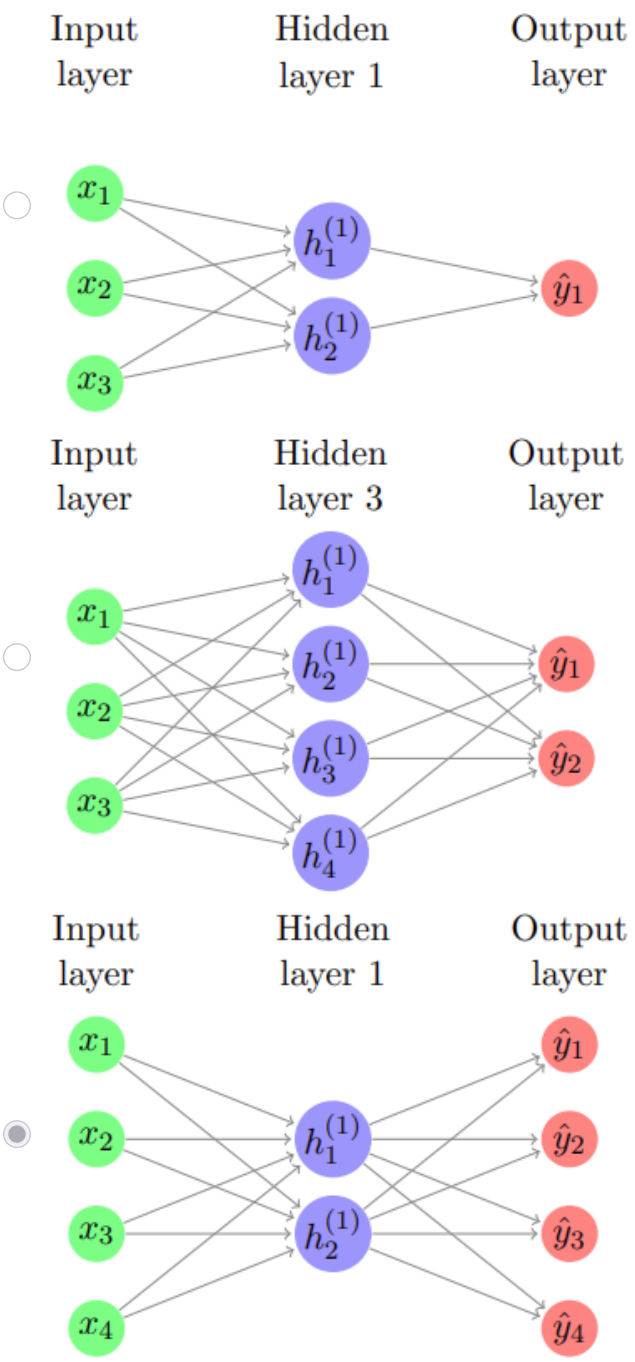
Accepted Answers:
*4*
*2*

6) Which of the following networks represents an autoencoder? ***1 point***

○ 

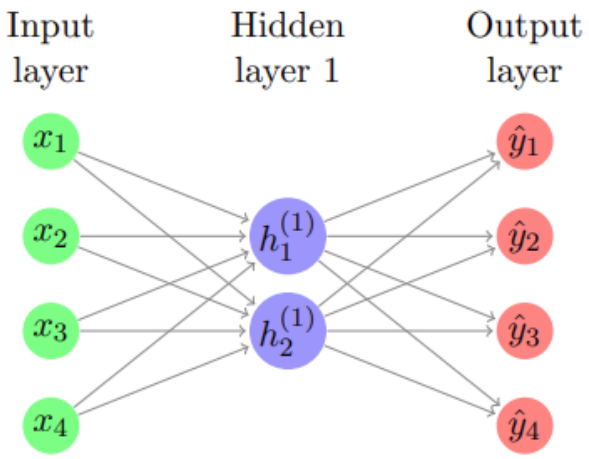
unit=83&lesson=250)

- Quiz: Week 6 : Assignment 6 (assessment?name=315)
- Week 7 ()
- Week 8 ()
- Week 9 ()
- week 10 ()
- Week 11 ()
- Week 12 ()
- Download Videos ()
- Books ()
- Text Transcripts ()
- Problem Solving Session - Jan 2025 ()




Yes, the answer is correct.
Score: 1

Accepted Answers:




7) What is the primary reason for adding corruption to the input data in a denoising autoencoder? **1 point**

- To increase the complexity of the model.
- To improve the model's ability to generalize to unseen data.
- To reduce the size of the training dataset.
- To increase the training time.

Yes, the answer is correct.
Score: 1
Accepted Answers:
*To improve the model's ability to generalize to unseen data.*

8) Suppose for one data point we have features $x_1, x_2, x_3, x_4, x_5$ as $-4, 6, 2.8, 0, 17.3$ then, which of the following function should we use on the output layer(decoder)? **1 point**

- Linear
- Logistic
- Relu
- Tanh

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

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

- [ ] Reconstruction error is very high while training
- [x] Reconstruction error is very low while training
- [x] Network fails to learn good representations of input
- [ ] Network learns good representations of input

Yes, the answer is correct.
Score: 1
Accepted Answers:
*Reconstruction error is very low while training*
*Network fails to learn good representations of input*

10) What is the purpose of a decoder in an autoencoder? ***1 point***

- (●) To reconstruct the input data
- ( ) To generate new data
- ( ) To compress the input data
- ( ) To extract features from the input data

Yes, the answer is correct.
Score: 1

Accepted Answers:
*To reconstruct the input data*