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Week 6 : Assignment 6

The due date for submitting this assignment has passed.

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

Assignment submitted on 2024-09-03, 20:52 IST

1) We are given an autoencoder A. The average activation value of neurons in this network is 0.01. The given autoencoder is ***1 point***

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

Yes, the answer is correct.
Score: 1

Accepted Answers:
Sparse autoencoder

2) 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)

0.01

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 4.0,4.1

1 point

3) If an under-complete autoencoder has an input layer with a dimension of 7, what could be the possible dimension of the hidden layer? ***1 point***

- [ ] 6
- [ ] 8
- [x] 0
- [ ] 7
- [x] 2

No, the answer is incorrect.
Score: 0

Accepted Answers:
6
2

4) 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.

No, the answer is incorrect.
Score: 0

Accepted Answers:
To improve the model's ability to generalize to unseen data.

5) 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

6) If the dimension of the input layer in an over-complete autoencoder is 5, what is the possible dimension of the hidden layer? ***1 point***

- ( ) 4
- ( ) 2
- (•) 8
- ( ) 0

Yes, the answer is correct.
Score: 1

Accepted Answers:
8

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

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- 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

8) Which of the following is a potential disadvantage of using autoencoders for dimensionality reduction over PCA? ***1 point***

- Autoencoders are computationally expensive and may require more training data than PCA.
- Autoencoders are bad at capturing complex relationships in data
- Autoencoders may overfit the training data and generalize poorly to new data.
- Autoencoders are unable to handle linear relationships between data.

Yes, the answer is correct.
Score: 1
Accepted Answers:
Autoencoders are computationally expensive and may require more training data than PCA.
Autoencoders may overfit the training data and generalize poorly to new data.

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

- 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 $-2, 12, 4.2, 7.6, 0$ then, which of the following function should we use on the output layer(decoder)? ***1 point***

- Logistic
- Relu
- Tanh
- Linear

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