Deep Learning

Assignment- Week 7

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 10 **Total mark: 10 X 1 = 10**

QUESTION 1:

Select the correct option about Sparse Autoencoder?

Statement 1: Sparse autoencoders introduces information bottleneck by reducing the number of nodes at hidden layers

Statement 2: The idea is to encourage network to learn an encoding and decoding which only relies on activating a small number of neurons

a. Both the statements are true
b. Statement 1 is true, but Statement 2 is false
c. Statement 1 is false, but statement 2 is true
d. Both the statements are false

Correct Answer: c

Detailed Solution:

Sparse autoencoders introduces an information bottleneck without requiring a reduction in the number of nodes at hidden layers. It encourages network to learn an encoding and decoding which only relies on activating a small number of neurons.

QUESTION 2:

Select the correct option about Denoising autoencoders?

Statement A: The loss is between the original input and the reconstruction from a noisy version of the input

Statement B: Denoising autoencoders can be used as a tool for feature extraction.

a. Both the statements are false
b. Statement A is false but Statement B is true

c. Statement A is true but Statement B is false
d. Both the statements are true

Correct Answer: d

Detailed Solution:

For denoising autoencoder, both statement 1 and 2 are true. Thus option (d) is correct

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QUESTION 3:

Which of the following autoencoder methods uses corrupted versions of the input?

a. Overcomplete design
b. Undercomplete Design
c. Sparse Design
d. Denoising Design

Correct Answer: d

Detailed Solution:

Refer to classroom lecture.

QUESTION 4:

Which of the following autoencoder methods uses a hidden layer with fewer units than the input layer?

a. Overcomplete design
b. Undercomplete Design
c. Sparse Design
d. Denoising Design

Correct Answer: b

Detailed Solution:

Refer to classroom lecture.

QUESTION 5:

Which of the following is false about autoencoder?

a. Autoencoders possesses generalization capabilities
b. Autoencoders are best suited for image captioning task
c. Its objective is to minimize the reconstruction loss so that output is similar to input
d. It compresses the input into a latent space representation and then reconstruct the output from it

Correct Answer: b

Detailed Solution:

Except option (b), rest all the options are true about auroencoders

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QUESTION 6:

Find the value of $d(t-34) * x(t+56)$; $d(t)$ being the delta function and * being the convolution operation.

a. $x(t+56)$
b. $x(t+32)$
c. $x(t+22)$
d. $x(t-56)$

Correct Answer: c

Detailed Solution:

Convolution of a function with delta shifts accordingly

QUESTION 7:

Impulse response is the output of _____system due to impulse input applied at time=0. Fill in the blanks from the options below.

a. Linear

b. Time Varying
c. Time Invariant
d. Linear And Time Invariant

Correct Answer: d

Detailed Solution:

Impulse response is output of LTI system due to impulse input pplied at time t=0 or n=0. Behaviour of an LTI system is characterized by its impulse response.

QUESTION 8:

Convolution of an input with the system impulse function gives the output of a___ system. Fill in the blanks.

a. Linear Time Invariant
b. Non-linear system
c. Time Invariant system
d. None of the above

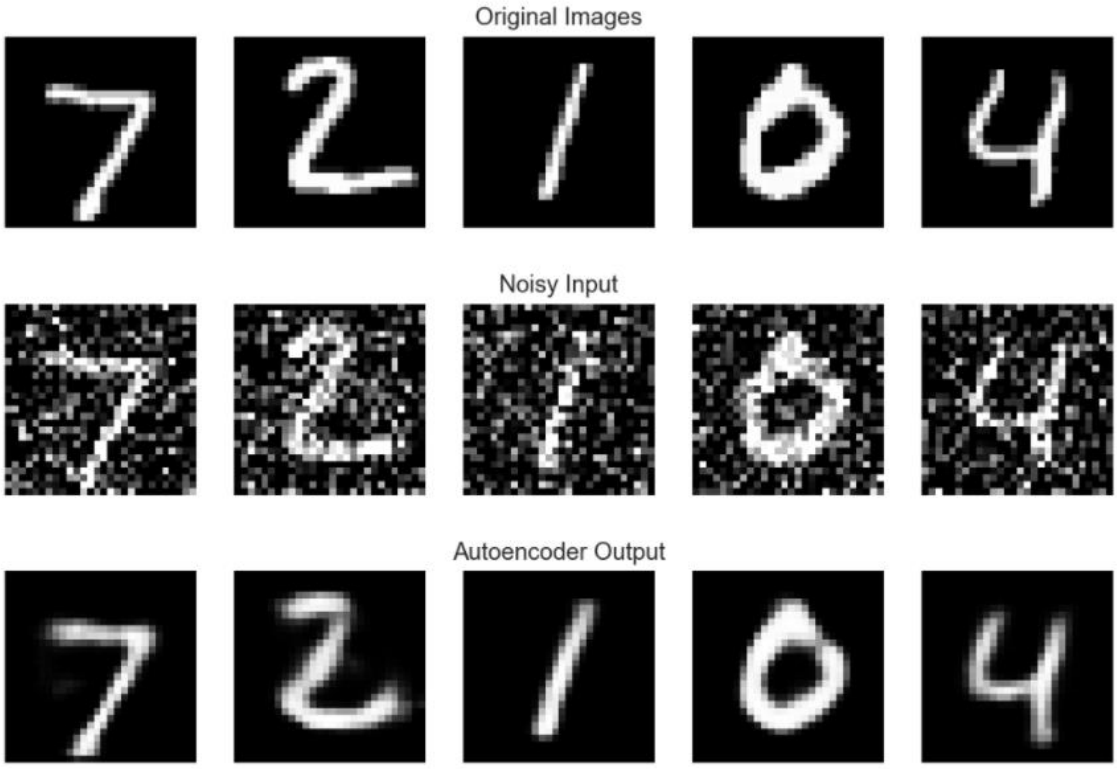
Correct Answer: a

Detailed Solution:

Direct from classroom lecture

QUESTION 9:

Given the image below where, Row 1: Original Input, Row 2: Noisy input, Row 3: Reconstructed output. Choose one of the following variants of autoencoder that is most suited to get Row 3 from Row 2.



a. Stacked autoencoder
b. Sparse autoencoder
c. Denoising autoencoder
d. None of the above

Correct Answer: c

Detailed Solution:

Reconstruction of original noise-free data from noisy input is the tasks of denoising autoencoder

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QUESTION 10:

Which of the following is true for Contractive Autoencoders?

a. penalizing instances where a small change in the input leads to a large change in the encoding space
b. penalizing instances where a large change in the input leads to a small change in the encoding space
c. penalizing instances where a small change in the input leads to a small change in the encoding space
d. None of the above

Correct Answer: a

Detailed Solution:

Direct from definition of Contractive autoencoders

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