Deep Learning

Assignment- Week 10

TYPE OF QUESTION: MCQ/MSQ

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

QUESTION 1:

What is not a reason for using batch-normalization??

   a. Prevent overfitting
   b. Faster convergence
   c. Faster inference time
   d. Prevent Co-variant shift

Correct Answer: c

Detailed Solution:

Inference time does not become faster due to batch normalization. It increases the computational burden. So, inference time increases.

QUESTION 2:

A neural network has 3 neurons in a hidden layer. Activations of the neurons for three batches are $\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}, \begin{bmatrix} 0 \\ 2 \\ 5 \end{bmatrix}, \begin{bmatrix} 6 \\ 9 \\ 2 \end{bmatrix}$ respectively. What will be the value of mean if we use batch normalization in this layer?

   a. $\begin{bmatrix} 2.33 \\ 4.33 \\ 3.33 \end{bmatrix}$

   b. $\begin{bmatrix} 2.00 \\ 2.33 \\ 5.66 \end{bmatrix}$

   c. $\begin{bmatrix} 1.00 \\ 1.00 \\ 1.00 \end{bmatrix}$

   d. $\begin{bmatrix} 0.00 \\ 0.00 \\ 0.00 \end{bmatrix}$
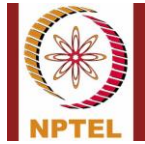
Correct Answer: a

Detailed Solution:

$$\frac{1}{3} \times \left(\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix} + \begin{bmatrix} 0 \\ 2 \\ 5 \end{bmatrix} + \begin{bmatrix} 6 \\ 9 \\ 2 \end{bmatrix} \right) = \begin{bmatrix} 2.33 \\ 4.33 \\ 3.33 \end{bmatrix}$$

QUESTION 3:

How can we prevent underfitting?

  a. Increase the number of data samples
  b. Increase the number of features
  c. Decrease the number of features
  d. Decrease the number of data samples

Correct Answer: b

Detailed Solution:

Underfitting happens whenever feature samples are capable enough to capture the data distribution. We need to increase the feature size, so data can be fitted perfectly well.

QUESTION 4:

How do we generally calculate mean and variance during testing?

  a. Batch normalization is not required during testing
  b. Mean and variance based on test image
  c. Estimated mean and variance statistics during training
  d. None of the above

Correct Answer: c

Detailed Solution:

We generally calculate batch mean and variance statistics during training and use the estimated batch mean and variance during testing.

QUESTION 5:

Which one of the following is not an advantage of dropout?

      a. Regularization
      b. Prevent Overfitting
      c. Improve Accuracy
      d. Reduce computational cost during testing

Correct Answer: d

Detailed Solution:

Dropout makes some random features during training but while testing we don't zero-down any feature. So there is no question of reduction of computational cost.

QUESTION 6:

What is the main advantage of layer normalization over batch normalization?

      a. Faster convergence
      b. Lesser computation
      c. Useful in recurrent neural network
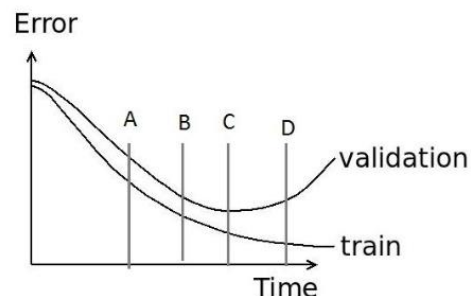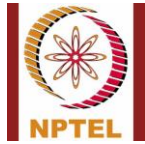   d. None of these

Correct Answer: c

Detailed Solution:

See the lectures/lecture materials.

QUESTION 7:

While training a neural network for image recognition task, we plot the graph of training error and validation error. Which is the best for early stopping?

a. A
b. B
c. C
d. D

Correct Answer: c

Detailed Solution:

Minimum validation point is the best for early stopping.

QUESTION 8:

Which among the following is NOT a data augmentation technique?

      a. Random horizontal and vertical flip of image
      b. Random shuffle all the pixels of an image
      c. Random color jittering
      d. All the above are data augmentation techniques

Correct Answer: b

Detailed Solution:

Random shuffle of all the pixels of the image will distort the image and neural network will be unable to learn anything. So, it is not a data augmentation technique.

QUESTION 9:

Which of the following is true about model capacity (where model capacity means the ability of neural network to approximate complex functions)?

      a. As number of hidden layers increase, model capacity increases
      b. As dropout ratio increases, model capacity increases
      c. As learning rate increases, model capacity increases
      d. None of these

Correct Answer: a

Detailed Solution:

Dropout and learning rate has nothing to do with model capacity. If hidden layers increase, it increases the number of learnable parameter. Therefore, model capacity increases.

QUESTION 10:

Batch Normalization is helpful because

a. It normalizes all the input before sending it to the next layer
b. It returns back the normalized mean and standard deviation of weights
c. It is a very efficient back-propagation technique
d. None of these

Correct Answer: a

Detailed Solution:

Batch normalization layer normalizes the input.

***********END*******