

## DEEP LEARNING INTERMEDIATE INTERVIEW QUESTIONS

### 1. What is the meaning of dropout in Deep Learning?

Dropout is a technique that is used to avoid overfitting a model in Deep Learning. If the dropout value is too low, then it will have minimal effect on learning. If it is too high, then the model can under-learn, thereby, causing lower efficiency.

### 2. What are tensors?

Tensors are multidimensional arrays in Deep Learning that are used to represent data. They represent the data with higher dimensions. Due to the high-level nature of the programming languages, the syntax of tensors is easily understood and broadly used.

### 3. What is the meaning of model capacity in Deep Learning?

In Deep Learning, model capacity refers to the capacity of the model to take in a variety of mapping functions. Higher model capacity means a large amount of information can be stored in the network.

We will check out neural network interview questions alongside as it is also a vital part of Deep Learning.

### 4. What is a Boltzmann machine?

A Boltzmann machine is a type of recurrent neural network that uses binary decisions, alongside biases, to function. These neural networks can be hooked up together to create deep belief networks, which are very sophisticated and used to solve the most complex problems out there.

## 5. What are some of the advantages of using TensorFlow?

TensorFlow has numerous advantages, and some of them are as follows:

- High amount of flexibility and platform independence
- Trains using CPU and GPU
- Supports auto differentiation and its features
- Handles threads and asynchronous computation easily
- Open-source
- Has a large community

## 6. What is a computational graph in Deep Learning?

A computation graph is a series of operations that are performed to take inputs and arrange them as nodes in a graph structure. It can be considered as a way of implementing mathematical calculations into a graph. This helps in parallel processing and provides high performance in terms of computational capability.

## 7. What is a CNN?

CNNs are convolutional neural networks that are used to perform analysis on image annotation and visuals. These classes of neural networks can input a multi-channel image and work on it easily.

These Deep Learning questions must be answered in a concise way. So make sure to understand them and revisit them if necessary.

## 8. What are the various layers present in a CNN?

There are four main layers that form a convolutional neural network:

- Convolution: These are layers consisting of entities called filters that are used as parameters to train the network.

- ReLu: It is used as the activation function and is always used with the convolution layer.
- Pooling: Pooling is the concept of shrinking the complex data entities that form after convolution and is primarily used to maintain the size of an image after shrinkage.
- Connectedness: This is used to ensure that all of the layers in the neural network are fully connected and activation can be computed using the bias easily.

## **9. What is an RNN in Deep Learning?**

RNNs stand for recurrent neural networks, which form to be a popular type of artificial neural network. They are used to process sequences of data, text, genomes, handwriting, and more. RNNs make use of backpropagation for the training requirements.

## **10. What is a vanishing gradient when using RNNs?**

Vanishing gradient is a scenario that occurs when we use RNNs. Since RNNs make use of backpropagation, gradients at every step of the way will tend to get smaller as the network traverses through backward iterations. This equates to the model learning very slowly, thereby, causing efficiency problems in the network.

## **11. What is exploding gradient descent in Deep Learning?**

Exploding gradients are an issue causing a scenario that clumps up the gradients. This creates a large number of updates of the weights in the model when training.

The working of gradient descent is based on the condition that the updates are small and controlled. Controlling the updates will directly affect the efficiency of the model.

## **12. What is the use of LSTM?**

LSTM stands for long short-term memory. It is a type of RNN that is used to sequence a string of data. It consists of feedback chains that give it the ability to perform like a general-purpose computational entity.

### **13. Where are autoencoders used?**

Autoencoders have a wide variety of usage in the real world. The following are some of the popular ones:

- Adding color to black-white images
- Removing noise from images
- Dimensionality reduction
- Feature removal and variation

### **14. What are the types of autoencoders?**

There are four main types of autoencoders:

- Deep autoencoders
- Convolutional autoencoders
- Sparse autoencoders
- Contractive autoencoders

### **15. What is a Restricted Boltzmann Machine?**

A Restricted Boltzmann Machine, or RBM for short, is an undirected graphical model that is popularly used in Deep Learning today. It is an algorithm that is used to perform:

- Dimensionality reduction
- Regression
- Classification
- Collaborative filtering
- Topic modeling

## **16. What do you mean by end-to-end learning?**

In end-to-end learning, the model will learn all the steps between the input and the output result. The model learns all the useful features extracted from the data, which helps train the model for the complex dataset.

## **17. What is Forward and Back Propagation in Deep Learning?**

Forward Propagation is the way data moves from left to right in the neural network, ie. from the input layer to the output layer.

Back Propagation is the way data moves from right to left, i.e., from the output layer to the input layer. Both ways help the data train properly; once the corrected weight is learned, it will be able to converge and generalize the data better.

## **18. What would happen if we set all the biases and weights to zero to train a neural network?**

Yes, if all the biases are set to zero, then the neural network model has a chance of learning.

No, if the training model is set to zero, because the neural network will never learn the complete task. If the weights are set to zero then the derivatives for each weight remain constant, which leads the neurons to learn the same features in each iteration and generate poor results.

## **19. Explain the difference between a Shallow Network and a Deep Network.**

Shallow Network: The shallow network has only one hidden layer; it will fit in any function, and it also requires a large number of input parameters. Shallow neural networks tell us exactly what is going on inside the deep neural network.

Deep Network: The deep network has numerous hidden layers, and it will also fit in any function. Deep neural networks are mostly used for data-driven modeling.

## 20. For the application of Face Detection, which deep learning algorithm would you use?

The best algorithm for face detection is Convolutional Neural Networks because CNN gives us better accuracy in object detection tasks, and it is a two-stage architecture with a region proposal network that improves localization.

## 21. What is an Activation Function?

The activation function in artificial neural networks helps the network learn the complex patterns in the data. The activation function is responsible for what data is to be fired to the next neurons at the end of the process.

## 22. What do you mean by an Epoch in the context of deep learning?

In deep learning, an epoch is a term that refers to the number of passes the machine has made across the fully trained dataset. The number of epochs is equal to the number of iterations if the batch size is the entire training dataset.

1     Formula,

2      $d * e = i * b$

where,

$d \rightarrow$  dataset size

$e \rightarrow$  number of epoch

$i \rightarrow$  number of iterations

$b \rightarrow$  batch size