DEEP LEARNING INTERVIEW QUESTION

1.What is Deep learning?

Ans. It is a subset of machine learning that is entirely based on Artificial neural network. It is inspired from human brain. In Deep learning we train a model on a training dataset and improvise it until the model predicts almost correctly on the testing and validation dataset.

2.What are the Applications of deep learning?

Ans. 🡺Pattern recognition and NLP

🡺Recognition and processing of images

🡺Automated translation

🡺Analysis of sentiment

🡺Automated text generation

3. What are Neural Network?

Ans. Neural Network is a method in Artificial Intelligence that teaches computers to process data in a way that is inspired by the human brain. It is a type of machine learning process called deep learning, that uses interconnected nodes or neurons in a layered structure that resembles the human brain.

4. What is Forward and Back Propagation in Deep learning?

Ans. Forward propagation is where input data is fed through a network, in a forward direction, to generate an output. The data is accepted by hidden layers and processed as per the activation function and moves to the successive layer.

Backpropagation or backward propagation of errors, is an algorithm that is designed to test for errors working back from output nodes to input nodes. It is an important mathematical tool for improving the accuracy of prediction in data mining and machine learning.

5. What do you mean by hyperparameters in the DEEP Learning?

Ans. They are variables that determine the network topology (for example- The number of hidden units) and how the network is trained

6. What is learning rate?

Ans. The learning rate is the rate at which a networks parameters are updated. The learning process is slowed by a low learning rate , but it eventually converges. A faster learning rate accelerates the learning process, but it may not converge.

7. What is an activation function?

Ans. An artificial neural networks activation function is a function that is introduced to help the network learn complex pattern in the data. It is converts input to outputs.

8. Difference between ML and DL?

Ans. ML🡺 Apply statistical algorithms to learn the hidden patterns and relationships in the dataset.

🡺Work on smaller amount of datasets

🡺Take less time to train the model

🡺Less complex and easy to interpret the result

DL🡺Uses artificial neural network to learn the hidden patterns and relationships in the dataset

🡺Require the larger volume of the dataset compared to machine learning

🡺Takes more time to train the model

🡺More complex and not easy to interpretations of the result

Q9. What are the Types of neural network?

Ans. FEEDFORWARD NEURAL NETWORK [FNNs]: are the simplest type of ANN, with a linear flow of information through the network. They have been widely used for tasks such as image classification, speech recognition and natural language processing.

CONVOLUTIONAL NEURAL NETWORK [CNNs]: are specially for image and video recognition tasks. They are able to automatically learn features from the images which makes them well suited for tasks such as image classification, object detection and image segmentation

RECURRENT NEURAL NETWORK [RNNs]: are type of neural network that is able to process sequential data, such as time series and natural processing language. Used for natural language processing, speech recognition, language translation.

10. What is a perceptron?

Ans. A perceptron is a type of artificial neural network unit, used as a building block in the field of neural network. It adjusts the weights of the inputs based on the error between the predicted output and the desired output.

11. What are optimizers?

Ans. An optimizer is a function or an algorithm that adjusts the attributes of the neural network, such as weights and learning rate. Thus, it helps in reducing the overall loss and improving accuracy.

12. What are different types of Optimizers in Deep learning?

Ans.

1.Gradient Descent Variants: It is an optimization algorithm for finding a local minimum of a differentiable function. It is simply used to find the values of a functions parameters that minimize a cost function as far as possible.

2.Nestrov Accelerated Gradient (Nag): a variant of momentum that reduces the error due to momentum by adjusting the gradient computation.

3. Adagrad: it changes the learning rate according to each feature or iteration.

4. RMS PROP: Improves upon adagrad by using a moving average of squared gradients, preventing the learning rate from decreasing too rapidly.

13.What are the types of activation function in ANN?

Ans. 1. Sigmoid function (logistic function): It maps the input to a value between 0 and 1.

2. Hyperbolic tangent function (tanh): Similar to the sigmoid function but it maps the input to a value between -1 and 1

3.Rectified Linear Unit: This function sets all negative values to zeros and keeps positive values unchanged.

4.Leaky Rectified Linear unit: This function is similar to Rectified Linear unit but allows a small negative slope for negative input values.

5. Parametric Rectified Linear unit: It is a genearalization of Rectified Linear unit that introduce a learnable parameter to determine the slope of negative input values.

6.Exponential Linear Unit(ELU): It is a variation of Rectified Linear unit that allow negative values with a smooth exponential decay

7. Soft max: It normalizes to output values to represent probabilities, ensuring that the sum of all probabilities is 1.

14. What is Dying ReLu?

Ans This condition known as dead state of relu neurons. It refers to the problem when ReLU neurons become inactive and only output 0 for any input

15. What is gradient exploding, Vanishing gradient and convergence?

Ans. Vanishing Gradient: It is error that occur during backpropagation when the slopes of the activation functions becomes smaller as we move backward through the layers of a neural network.

Gradient Exploding: These gradients are used to update the weights. If the gradients are large, the multiplication of these gradients will become huge over time. This results in the model being unable to learn and its behaviour becomes unstable. This problem is called the exploding gradient.

Convergence: The process by which a deep neural network gradually improves its performance through repeated iterations of model.

16. What is droupout in Deep learning?

Ans. It is a regularization technique used in dl that aims to prevent overfitting and improve generalization performance of neural network.

17. What is regularization concept in deep learning?

Ans. It is used in ml and dl both to prevent overfitting and improve the generalization ability of model.

18. What is fine-tuning in deep learning?

Ans. The process of making small adjustments to achieve the desired output or performance.

19.What is Data Augmentation?

Ans. It is the process of artificially generating new data from existing data, primarily to train new machine learning models.

20. What is the concept of sequence-to-sequence models?

Ans. Sequence-to-sequence models are a class of neural networks used for tasks that involve transforming an input sequence into an output sequence. They are particularly effective in tasks like machine translation , text summarization , dialogue generation etc.