WORKSHEET-1

DEEP LEARNING

Q1 to Q8 are MCQs with only one correct answer. Choose the correct option.

1. Which of the following can approximate any function universally (i.e. universal approximators)?

A) Boosted Decision Trees B) Neural Networks C) Kernel SVM D) All of the above

2. In which of the following domains we cannot use neural networks?

A) Image Processing B) Speech Processing C) Fraud Detection D) None of the above

3. Rearrange the following steps of a gradient descent algorithm in correct order of their occurrence?

i. Initialize random weight and bias

ii. Repeat the process until you find the best weights of network

iii. Change weights and biases for each neuron to reduce the error

iv. Calculate error distances between the actual and the predicted value

v. Pass an input through the network and get values from output layer

Choose the correct option:

A) iv – i – iii – v – ii B) v – i – iii – iv –ii C) i – v – iv – iii – ii D) i – v – iii –iv –ii

4. What is the full form of RNN?

A) Recurrent Neural Network B) Recursive Neural Network C) Redundant Neural Network D) Resurrection Neural Network

5. What is plasticity in neural networks?

A) input pattern keeps on changing B) input pattern has become static C) output pattern keeps on changing D) output is static

6. What is stability plasticity dilemma?

A) system can neither be stable nor plastic B) static inputs & categorization can’t be handled C) dynamic inputs & categorization can’t be handled D) none of the above

7. Read the following statements:

Statement 1: It is possible to train a network well by initializing all the weights as 0

Statement 2: It is possible to train a network well by initializing biases as 0

Which of the statements given above is true, Choose the correct option?

A) Statement 1 is true while Statement 2 is false B) Statement 2 is true while statement 1 is false C) Both statements are true D) Both statements are false

8. Which of the following architecture has feedback connections?

A) Recurrent Neural network B) Convolutional Neural Network C) Restricted Boltzmann Machine D) simple Artificial Neural Network

Q9 and Q10 are MCQs with one or more correct answers. Choose all the correct options.

9. In training a neural network, you notice that the loss does not decrease in the few starting epochs. The reason behind it could be

A) Learning Rate is low B) Regularisation parameter is high C) Regularisation parameter is low D) Stuck at local minima

10. Which of the following function(s) can be used to impart non – linearity in a neural network?

A) Stochastic Gradient Descent B) Rectified Linear Unit C) Convolution Function D) Sigmoid Function

Q11 to Q15 are subjective answer type question. Answer them briefly.

11. What is Deep Learning?

Ans: Deep learning is a machine learning technique that teaches computers to do what comes naturally to humans: learn by example. In deep learning, a computer model learns to perform classification tasks directly from images, text, or sound. Deep learning models can achieve state-of-the-art accuracy, sometimes exceeding human-level performance. Models are trained by using a large set of labeled data and neural network architectures that contain many layers. Deep learning is a key technology behind driverless cars, enabling them to recognize a stop sign, or to distinguish a pedestrian from a lamppost. It is the key to voice control in consumer devices like phones, tablets, TVs, and hands-free speakers

12. What is reinforcement learning?

Ans: Reinforcement learning is an area of Machine Learning. It is about taking suitable action to maximize reward in a particular situation. It is employed by various software and machines to find the best possible behavior or path it should take in a specific situation. Reinforcement learning is all about making decisions sequentially. In simple words we can say that the output depends on the state of the current input and the next input depends on the output of the previous input. Example: Chess game

13. What Are the Differences Between Machine Learning and Deep Learning?

Ans:

Machine learning and deep learning are two subsets of artificial intelligence which have garnered a lot of attention over the past two years.

Machine Learning: A subset of artificial intelligence involved with the creation of algorithms which can modify itself without human intervention to produce desired output- by feeding itself through structured data.

Deep Learning: A subset of machine learning where algorithms are created and function similar to those in machine learning, but there are numerous layers of these algorithms- each providing a different interpretation to the data it feeds on. Such a network of algorithms are called artificial neural networks, being named so as their functioning is an inspiration, or you may say; an attempt at imitating the function of the human neural networks present in the brain.

The key difference between deep learning vs machine learning stems from the way data is presented to the system. Machine learning algorithms almost always require structured data, whereas deep learning networks rely on layers of the ANN (artificial neural networks).

Machine learning algorithms are built to “learn” to do things by understanding labeled data, then use it to produce further outputs with more sets of data. However, they need to be retrained through human intervention when the actual output isn’t the desired one.

Deep learning networks do not require human intervention as the nested layers in the neural networks put data through hierarchies of different concepts, which eventually learn through their own errors. However, even these are subject to flawed outputs if the quality of data isn’t good enough.

14. What is a perceptron?

Ans: A perceptron is a neural network unit (an artificial neuron) that does certain computations to detect features or business intelligence in the input data.A Perceptron is an algorithm for supervised learning of binary classifiers. This algorithm enables neurons to learn and processes elements in the training set one at a time.

There are two types of Perceptrons: Single layer and Multilayer.

Single layer Perceptrons can learn only linearly separable patterns.

Multilayer Perceptrons or feedforward neural networks with two or more layers have the greater processing power.

The Perceptron algorithm learns the weights for the input signals in order to draw a linear decision boundary.

This enables you to distinguish between the two linearly separable classes +1 and -1.

15. What’s the difference between AI and ML?

Ans: Artificial Intelligence : The word Artificial Intelligence comprises of two words “Artificial” and “Intelligence”. Artificial refers to something which is made by human or non natural thing and Intelligence means ability to understand or think. There is a misconception that Artificial Intelligence is a system, but it is not a system .AI is implemented in the system. There can be so many definition of AI, one definition can be “It is the study of how to train the computers so that computers can do things which at present human can do better.”Therefore It is a intelligence where we want to add all the capabilities to machine that human contain.

Machine Learning : Machine Learning is the learning in which machine can learn by its own without being explicitly programmed. It is an application of AI that provide system the ability to automatically learn and improve from experience. Here we can generate a program by integrating input and output of that program. One of the simple definition of the Machine Learning is “Machine Learning is said to learn from experience E w.r.t some class of task T and a performance measure P if learners performance at the task in the class as measured by P improves with experiences.”