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

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
   ANS C

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
   ANS B

4. What is the full form of RNN?
   A) Recurrent Neural Network
   B) Recursive Neural Network
   C) Redundant Neural Network
   D) Resurrection Neural Network
   ANS A

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
   ANS A

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
   ANS C

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
   ANS B

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

   ANS A

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
   ANS D

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

    ANS D & B

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

11. What is Deep Learning?
12. What is reinforcement learning?
13. What Are the Differences Between Machine Learning and Deep Learning?
14. What is a perceptron?
15. What's the difference between AI and ML?

ANS 11)
Deep Learning is a subset of Machine Learning, which on the other hand is a subset of Artificial Intelligence. Artificial Intelligence is a general term that refers to techniques that enable computers to mimic human behavior. Machine Learning represents a set of algorithms trained on data that make all of this possible.

   Deep Learning, on the other hand, is just a type of Machine Learning, inspired by the structure of a human brain. Deep learning algorithms attempt to draw similar conclusions as humans would by continually analyzing data with a given logical structure. To achieve this, deep learning uses a multi-layered structure of algorithms called neural networks.
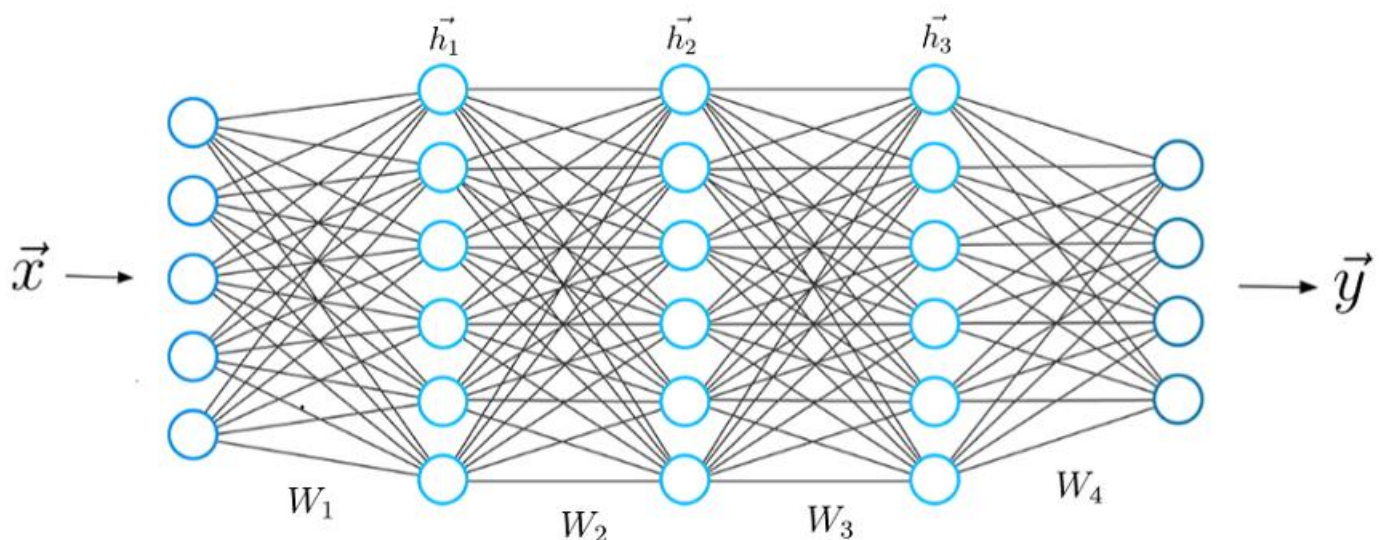
The design of the neural network is based on the structure of the human brain. Just as we use our brains to identify patterns and classify different types of information, neural networks can be taught to perform the same tasks on data.

The individual layers of neural networks can also be thought of as a sort of filter that works from gross to subtle, increasing the likelihood of detecting and outputting a correct result.

The human brain works similarly. Whenever we receive new information, the brain tries to compare it with known objects. The same concept is also used by deep neural networks.

ANS12

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 differs from the supervised learning in a way that in supervised learning the training data has the answer key with it so the model is trained with the correct answer itself whereas in reinforcement learning, there is no answer but the reinforcement agent decides what to do to perform the given task. In the absence of a training dataset, it is bound to learn from its experience.

The problem is as follows: We have an agent and a reward, with many hurdles in between. The agent is supposed to find the best possible path to reach the reward. The following problem explains the problem more easily.

ANS 13

Differences between deep learner and machine learning:

1. The main difference between deep learning and machine learning is due to the way data is presented in the system. Machine learning algorithms almost always require structured data, while deep learning networks rely on layers of ANN (artificial neural networks).
2. Machine learning algorithms are designed to "learn" to act by understanding labeled data and then use it to produce new results with more datasets. However, when the result is incorrect, there is a need to "teach them".
3. Deep learning networks do not require human intervention, as multilevel layers in neural networks place data in a hierarchy of different concepts, which ultimately learn from their own mistakes. However, even they can be wrong if the data quality is not good enough.
4. Data decides everything. It is the quality of the data that ultimately determines the quality of the result.

ANS 14

Welcome to the second lesson of the 'Perceptron' of the Deep Learning Tutorial, which is a part of the Deep Learning (with TensorFlow) Certification Course offered by Simplilearn. This lesson gives you an in-depth knowledge of Perceptron and its activation functions.

Let us begin with the objectives of this lesson.

Objectives

After completing this lesson on 'Perceptron', you'll be able to:

- Explain artificial neurons with a comparison to biological neurons
- Implement logic gates with Perceptron
- Describe the meaning of Perceptron
- Discuss Sigmoid units and Sigmoid activation function in Neural Network
- Describe ReLU and Softmax Activation Functions
- Explain Hyperbolic Tangent Activation Function

Here is key difference between AI and ML are:

ARTIFICIAL INTELLIGENCE	MACHINE LEARNING
AI stands for Artificial intelligence, where intelligence is defined acquisition of knowledge intelligence is defined as a ability to acquire and apply knowledge.	ML stands for Machine Learning which is defined as the acquisition of knowledge or skill
The aim is to increase chance of success and not accuracy.	The aim is to increase accuracy, but it does not care about success
It work as a computer program that does smart work	It is a simple concept machine takes data and learn from data.
The goal is to simulate natural intelligence to solve complex problem	The goal is to learn from data on certain task to maximize the performance of machine on this task.
AI is decision making.	ML allows system to learn new things from data.
It leads to develop a system to mimic human to respond behave in a circumstances.	It involves in creating self learning algorithms.
AI will go for finding the optimal solution.	ML will go for only solution for that whether it is optimal or not.
AI leads to intelligence or wisdom.	ML leads to knowledge.