**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)?
   1. Boosted Decision Trees B) Neural Networks

C) Kernel SVM D) All of the above

Ans- D

1. In which of the following domains we cannot use neural networks?
   1. Image Processing B) Speech Processing

C) Fraud Detection D) None of the above

Ans- D

1. Rearrange the following steps of a gradient descent algorithm in correct order of their occurrence?
2. Initialize random weight and bias
3. Repeat the process until you find the best weights of network
4. Change weights and biases for each neuron to reduce the error
5. Calculate error distances between the actual and the predicted value
6. 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-A

1. What is the full form of RNN?
   1. Recurrent Neural Network B) Recursive Neural Network

C) Redundant Neural Network D) Resurrection Neural Network

Ans- A

1. What is plasticity in neural networks?
   1. input pattern keeps on changing B) input pattern has become static

C) output pattern keeps on changing D) output is static

Ans- A

1. What is stability plasticity dilemma?
   1. system can neither be stable nor plastic
   2. static inputs & categorization can’t be handled
   3. dynamic inputs & categorization can’t be handled
   4. none of the above

Ans- C

1. 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?

* 1. Statement 1 is true while Statement 2 is false
  2. Statement 2 is true while statement 1 is false
  3. Both statements are true
  4. Both statements are false

Ans- B

1. Which of the following architecture has feedback connections?
   1. 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.

1. In training a neural network, you notice that the loss does not decrease in the few starting epochs. The reason behind it could be
   1. Learning Rate is low B) Regularisation parameter is high

C) Regularisation parameter is low D) Stuck at local minima

Ans- A, D

1. Which of the following function(s) can be used to impart non – linearity in a neural network?
   1. Stochastic Gradient Descent B) Rectified Linear Unit

C) Convolution Function D) Sigmoid Function

Ans-B

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

1. What is Deep Learning?

Ans- **Deep Learning** is a subfield of machine learning concerned with algorithms inspired by the structure and function of the brain called **artificial neural networks**. Deep learning is part of a broader family of machine learning methods based on artificial neural networks with representation learning. Learning can be supervised, semi-supervised or unsupervised. It teaches a computer to filter inputs through layers to learn how to predict and classify information. Observations can be in the form of images, text, or sound. The inspiration for deep learning is the way that the human brain filters information.

1. What is reinforcement learning?

Ans- Reinforcement Learning (RL) is a type of machine learning technique that enables an agent to learn in an interactive environment by trial and error using feedback from its own actions and experiences.

Though both supervised and reinforcement learning use mapping between input and output, unlike supervised learning where feedback provided to the agent is correct set of actions for performing a task, reinforcement learning uses rewards and punishment as signals for positive and negative behaviour.

As compared to unsupervised learning, reinforcement learning is different in terms of goals. While the goal in unsupervised learning is to find similarities and differences between data points, in reinforcement learning the goal is to find a suitable action model that would maximize the total cumulative reward of the agent. The figure below represents the basic idea and elements involved in a reinforcement learning model.

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

Ans- **Machine learning**is a subset of artificial intelligence associated with creating algorithms that can change themselves without human intervention to get the desired result – by feeding themselves through structured data.

**Deep learning** is a subset of machine learning where algorithms are created and function similarly to machine learning, but there are many levels of these algorithms, each providing a different interpretation of the data it conveys. This network of algorithms is called artificial neural networks. In simple words, it resembles the neural connections that exist in the human brain

13. 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.**Perceptron** is a single layer neural network and a multi-layer **perceptron** is called Neural Networks. **Perceptron** is a linear classifier (binary). Also, **it** is **used** in supervised learning. **It** helps to classify the given input data

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

Ans- Artificial intelligence and machine learning are the part of computer science that are correlated with each other. These two technologies are the most trending technologies which are used for creating intelligent systems.

The Artificial intelligence system does not require to be pre-programmed, instead of that, they use such algorithms which can work with their own intelligence. It involves machine learning algorithms such as Reinforcement learning algorithm and deep learning neural networks. AI is being used in multiple places such as Siri, Google?s Alpha Go, AI in Chess playing, etc.

Based on capabilities, AI can be classified into three types:

* **Weak AI**
* **General AI**
* **Strong AI**

Currently, we are working with weak AI and general AI. The future of AI is Strong AI for which it is said that it will be intelligent than humans.

**Machine learning** is a subfield of artificial intelligence, which enables machines to learn from past data or experiences without being explicitly programmed.

Machine learning enables a computer system to make predictions or take some decisions using historical data without being explicitly programmed. Machine learning uses a massive amount of structured and semi-structured data so that a machine learning model can generate accurate result or give predictions based on that data.

Machine learning works on algorithm which learn by it?s own using historical data. It works only for specific domains such as if we are creating a machine learning model to detect pictures of dogs, it will only give result for dog images, but if we provide a new data like cat image then it will become unresponsive. Machine learning is being used in various places such as for online recommender system, for Google search algorithms, Email spam filter, Facebook Auto friend tagging suggestion, etc.

It can be divided into three types:

* **Supervised learning**
* **Reinforcement learning**
* **Unsupervised learning**