**WORKSHEET-1**

**DEEP LEARNING**

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

Answer: B) Neural Networks

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

Answer: D) None of the above

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

Answer: C) i – v – iv – iii – ii

4. What is the full form of RNN?

Answer: A) Recurrent Neural Network

5. What is plasticity in neural networks?

Answer: C) output pattern keeps on changing

6. What is stability plasticity dilemma?

Answer: 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?

Answer: B) Statement 2 is true while statement 1 is false

8. Which of the following architecture has feedback connections?

Answer: A) Recurrent Neural network

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

Answer: A) Learning Rate is low

B) Regularisation parameter is high

D) Stuck at local minima

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

Answer: B) Rectified Linear Unit

11. What is Deep Learning?

Answer: Deep learning is a computer software that mimics the network of neurons in a brain. It is a subset of machine learning and is called deep learning because it makes use of deep neural networks. Specifically, it’s a type of machine learning that aims to teach computer to learn by itself examples. And it needs large amount of data to train. Deep learning learns from data by itself. It’s the side of machine learning that uses unstructured data or messy data to draw its own conclusions.

So, for instance, deep learning will take thousands of images of lots of different things, then it will spot patterns to learn how to classify those images. The idea behind deep learning, is for the computer to learn independently without human telling it what to look for.

12. What is reinforcement learning?

Answer: Reinforcement Learning is a feedback-based Machine learning technique in which an agent learns to behave in an environment by performing the actions and seeing the results of actions. For each good action, the agent gets positive feedback, and for each bad action, the agent gets negative feedback or penalty. In reinforcement learning, an artificial intelligence faces a game-like situation. The computer employs trial and error to come up with a solution to the problem. To get the machine to do what the programmer wants, the artificial intelligence gets either rewards or penalties for the actions it performs. Its goal is to maximize the total reward. It is a core part of [Artificial intelligence](https://www.javatpoint.com/artificial-intelligence-tutorial), and all AI agent works on the concept of reinforcement learning. Here we do not need to pre-program the agent, as it learns from its own experience without any human intervention.

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

Answer:

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| Machine Learning | Deep Learning |
| Machine learning uses algorithms to parse data, learn from that data, and make informed decisions based on what it has learned | Deep learning structures algorithms in layers to create an “artificial neural network” that can learn and make intelligent decisions on its own |
| Can train on lesser training data | Requires large data sets for training |
| Takes less time to train | Takes longer time to train |
| Trains on CPU | Trains on GPU for proper training |
| The output is in numerical form for classification and scoring applications | The output can be in any form including free form elements such as free text and sound or images |
| Limited tuning capability for hyperparameter tuning | Can be tuned in various ways |

14. What is a perceptron?

Answer: 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. A neural network is an interconnected system of perceptrons, so it is safe to say perceptrons are the foundation of any neural network. Perceptrons can be viewed as building blocks in a single layer in a neural network, made up of four different parts:

1. Input Values or One Input Layer
2. Weights and Bias
3. Net sum
4. Activation function

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.

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

Answer:

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| **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. |
| AI has a very wide range of scope. | Machine learning has a limited scope. |
| The main applications of AI are Siri, customer support using catboats, Expert System, Online game playing, intelligent humanoid robot, etc. | The main applications of machine learning are Online recommender system, Google search algorithms, Facebook auto friend tagging suggestions, etc. |