



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

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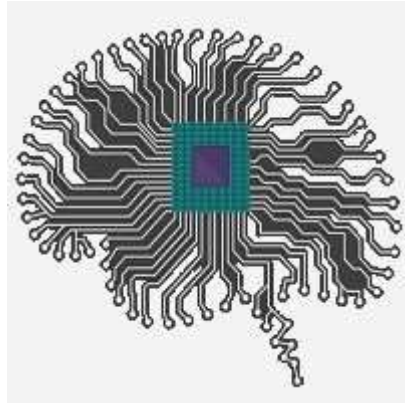
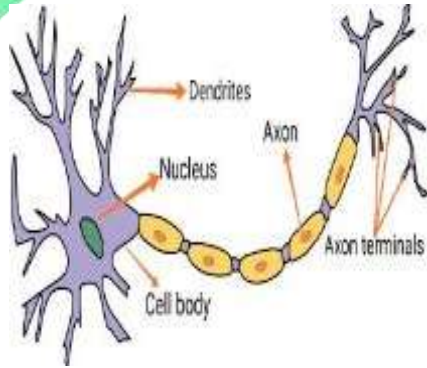
UNIT II: NEURAL NETWORK

TOPIC: **INTRODUCTION TO ARTIFICIAL NEURAL NETWORK**





TOPIC OUTLINE

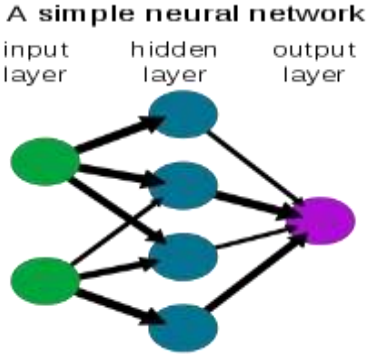


- What is Artificial Neural Network?
- The architecture of an artificial neural network
- Advantages of ANN
- Disadvantages of ANN



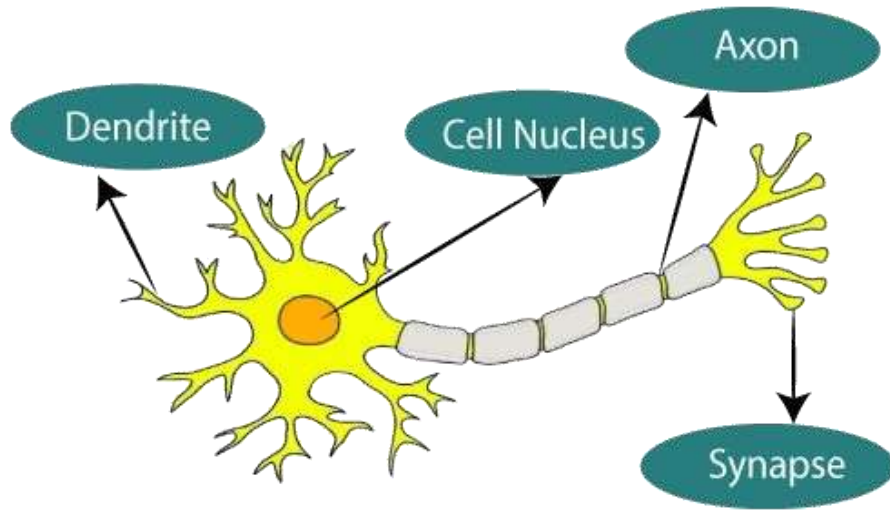
What is Artificial Neural Network?

The term "**Artificial Neural Network**" is derived from Biological neural networks that develop the structure of a human brain. Similar to the human brain that has neurons interconnected to one another, artificial neural networks also have neurons that are interconnected to one another in various layers of the networks. These neurons are known as nodes.



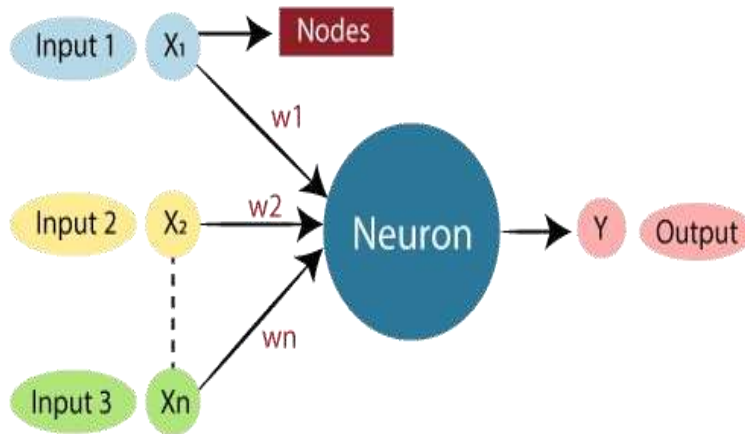


The given figure illustrates the typical diagram of Biological Neural Network:





The typical Artificial Neural Network looks something like the given figure:



Dendrites from Biological Neural Network represent inputs in Artificial Neural Networks, cell nucleus represents Nodes, synapse represents Weights, and Axon represents Output.



Relationship between Biological neural network and artificial neural network:

Biological Neural Network	Artificial Neural Network
Cell nucleus	Nodes
Synapse	
Axon	Output



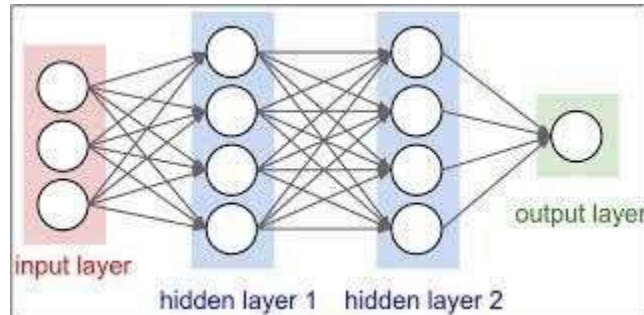
- An **Artificial Neural Network** in the field of **Artificial intelligence** where it attempts to mimic the network of neurons makes up a human brain so that computers will have an option to understand things and make decisions in a human-like manner. The artificial neural network is designed by programming computers to behave simply like interconnected brain cells.

- There are around 1000 billion neurons in the human brain. Each neuron has an association point somewhere in the range of 1,000 and 100,000. In the human brain, data is stored in such a manner as to be distributed, and we can extract more than one piece of this data when necessary from our memory parallelly. We can say that the human brain is made up of incredibly amazing parallel processors.



The architecture of an artificial neural network:

To understand the concept of the architecture of an artificial neural network, we have to understand what a neural network consists of. In order to define a neural network that consists of a large number of artificial neurons, which are termed units arranged in a sequence of layers. Lets us look at various types of layers available in an artificial neural network.





Artificial Neural Network primarily consists of three layers:

Input Layer:

As the name suggests, it accepts inputs in several different formats provided by the programmer.

Hidden Layer:

The hidden layer presents in-between input and output layers. It performs all the calculations to find hidden features and patterns.

Output Layer:

The input goes through a series of transformations using the hidden layer, which finally results in output that is conveyed using this layer.

The artificial neural network takes input and computes the weighted sum of the inputs and includes a bias. This computation is represented in the form of a transfer function.



Advantages of Artificial Neural Network:

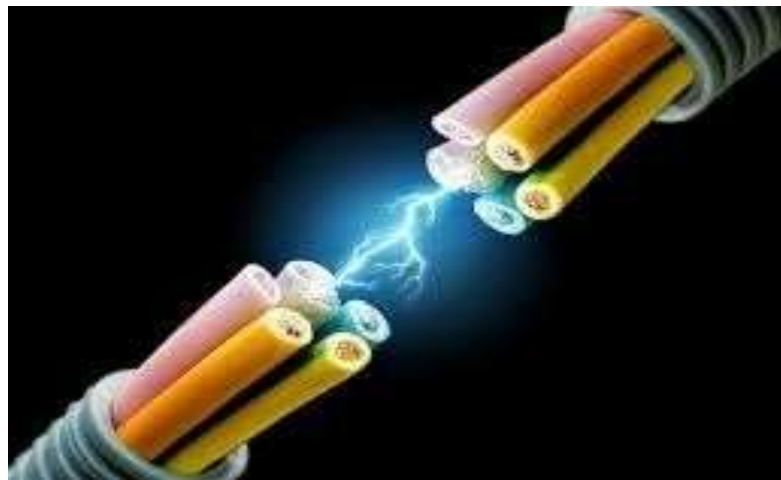
- A neural network can implement tasks that a linear program cannot.
- A neural network determines and does not require to be reprogrammed.
- It can be executed in any application.

Disadvantages of Artificial Neural Network:

- The neural network required training to operate.
- The structure of a neural network is disparate from the structure of microprocessors therefore required to be emulated.
- It needed high processing time for big neural networks



RECAP....



...THANK YOU