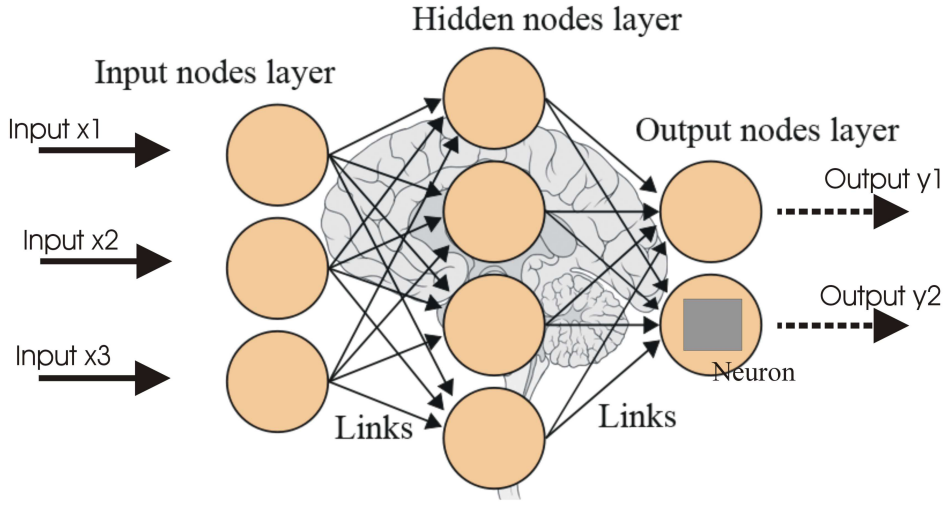
Neural Network

Basic Structure of a Neural Network:

A neural network typically consists of three main layers:

1. **Input Layer:**
    - Receives raw data (e.g., images, text, numbers).
    - Each node represents a feature or input variable.
2. **Hidden Layer(s):**
    - Processes the input data.
    - Extracts features and learns patterns.
    - The number of hidden layers and neurons per layer can vary.
3. **Output Layer:**
    - Produces the final prediction or decision.
    - The number of nodes in the output layer depends on the task.



How Neural Networks Work:

1. **Forward Propagation:**
    - Input data is fed into the input layer.
    - Each neuron in a layer calculates a weighted sum of its inputs, adds a bias, and applies an activation function.
    - The output of one layer becomes the input for the next layer.
    - This process continues until the output layer produces a prediction.
2. **Backpropagation:**
    - If the prediction is incorrect, the network adjusts its weights and biases to minimize the error.
    - The error is propagated backward through the network, layer by layer.
    - The weights and biases are updated using an optimization algorithm like gradient descent.