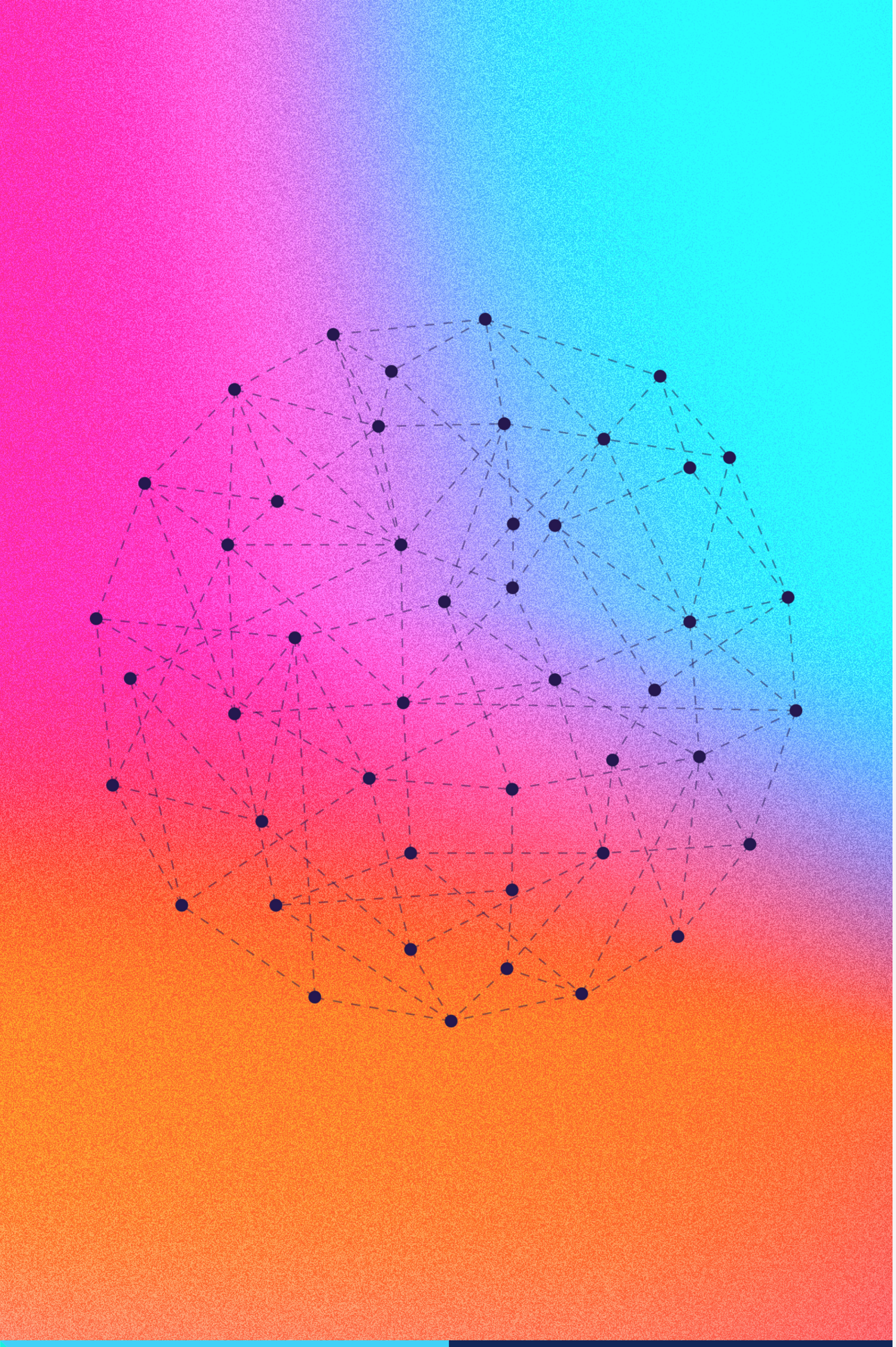
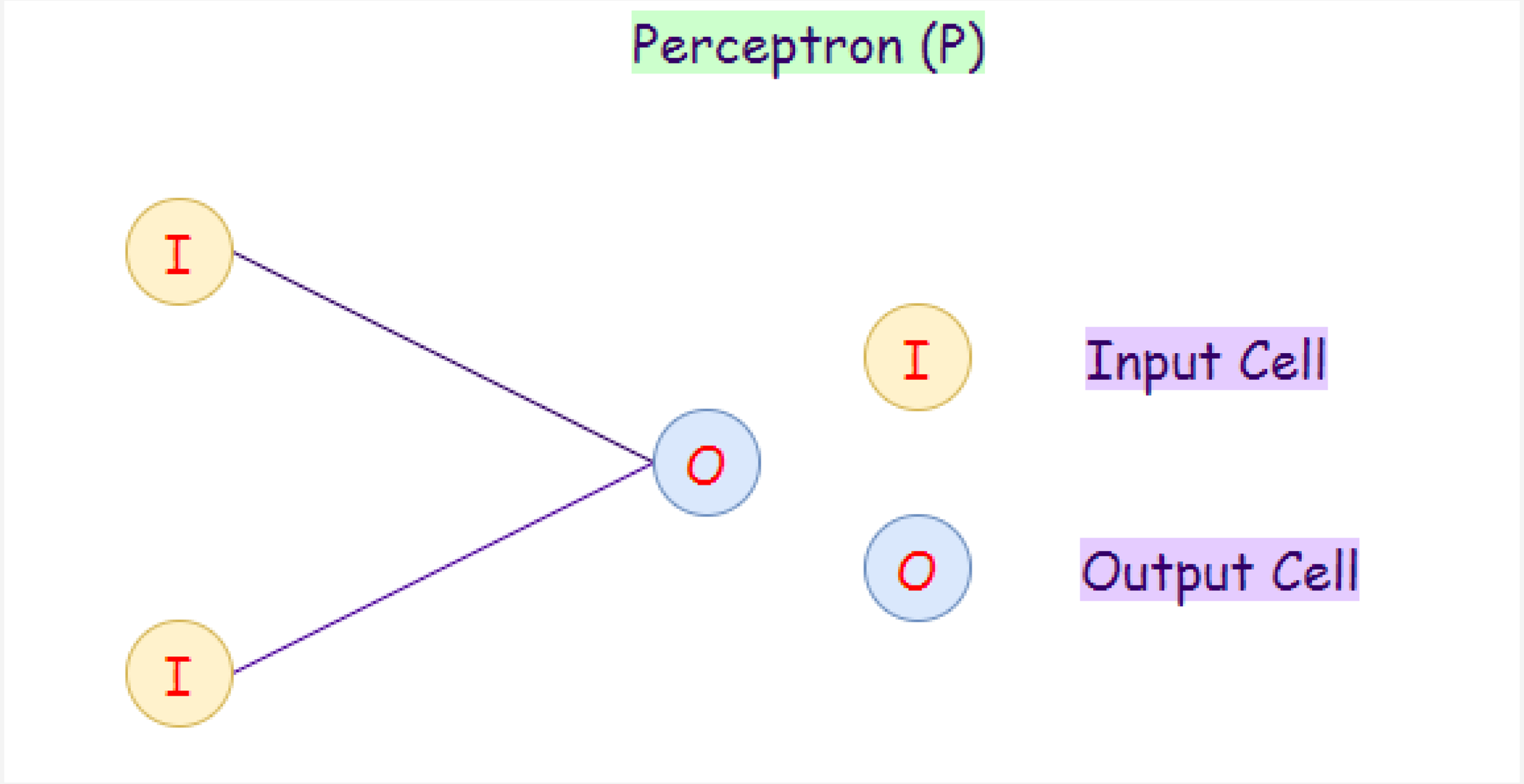


Types of Neural Networks

PART 1 of 5

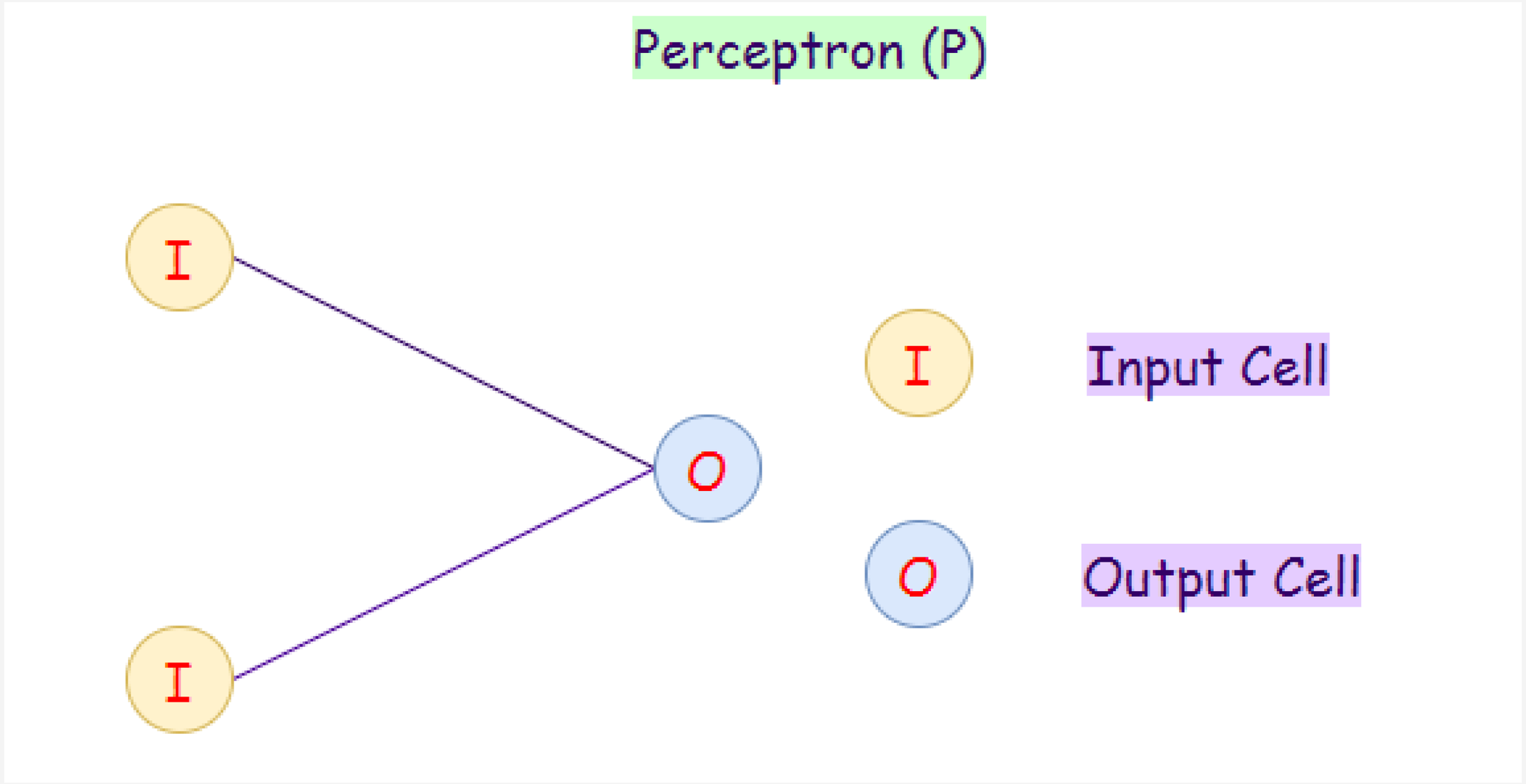
Perceptron



Single Layer Neural Network with no hidden layers

These neural networks don't have any hidden layers. The weighted input for each node is determined using an input. After that, it classifies data using an activation function, often a sigmoid function.

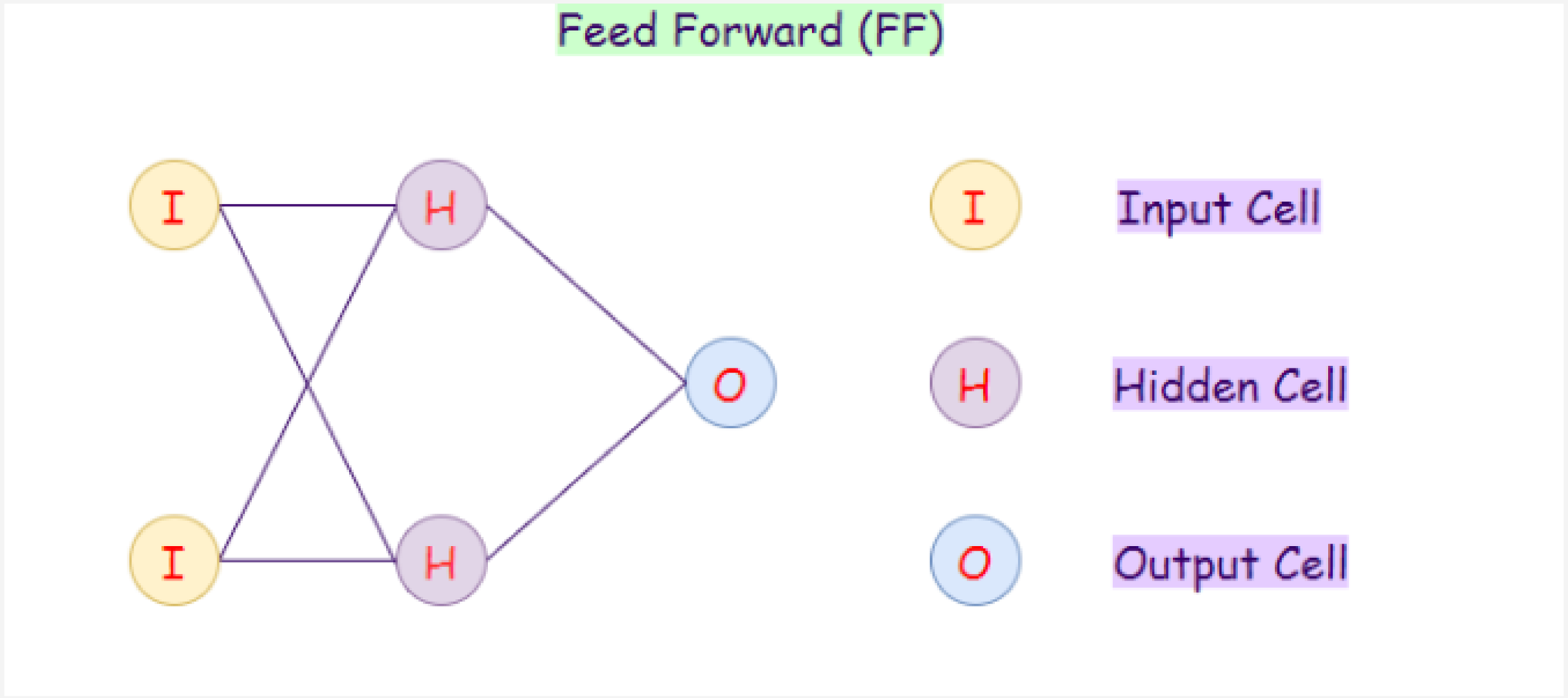
Perceptron



Applications:

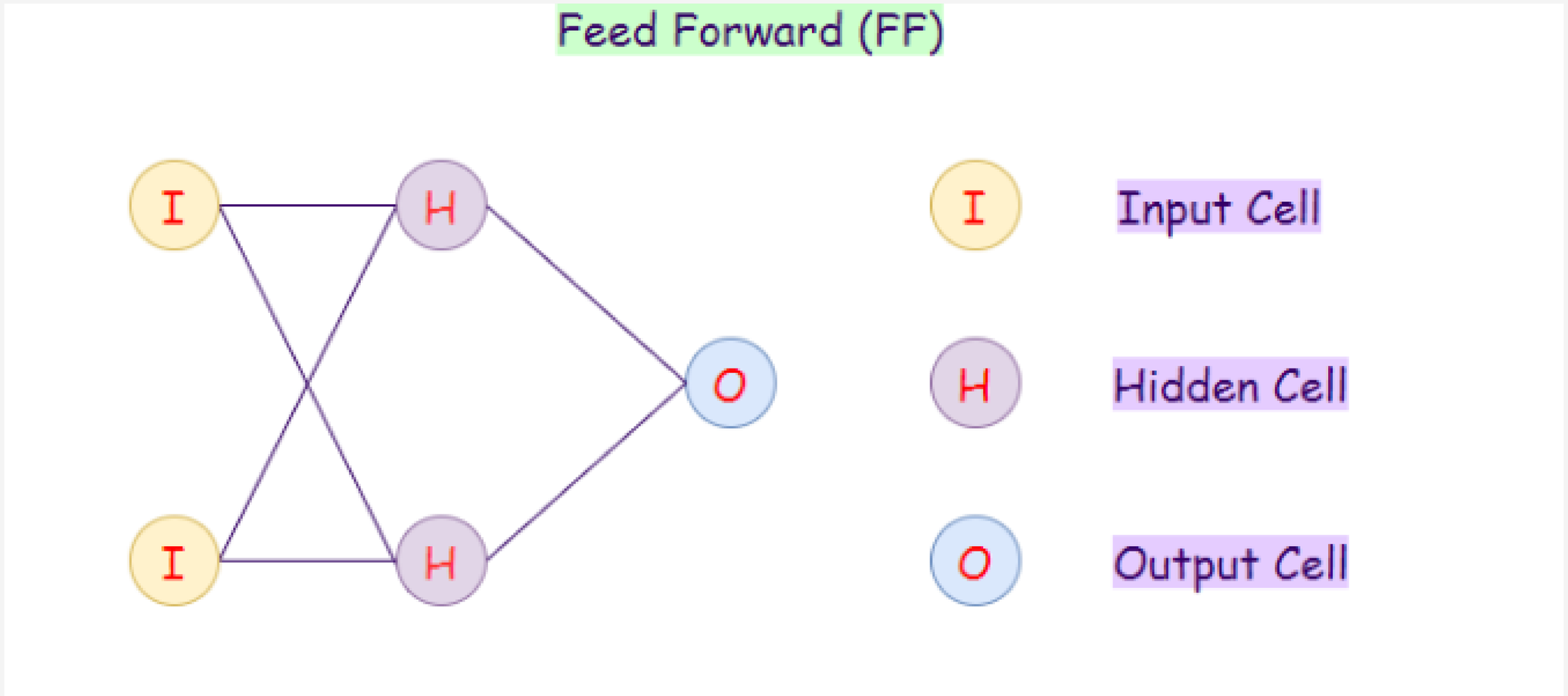
- Classification.
- Encode Database (Multilayer Perceptron).
- Monitor Access Data (Multilayer Perceptron).

Feed Forward(FF)



A feed-forward neural network is a type of artificial neural network where cycles between the nodes never occur. All of the perceptrons in this neural network are organised in layers, with the input layer receiving input and the output layer producing output. The reason the hidden layers are named hidden is because they are disconnected from the outside world. Every perceptron in one layer of a feed-forward neural network is linked to every node in the following layer. As a result, every node has complete connectivity. Another thing to note is that the nodes on the same layer are not connected, either visibly or invisibly. The feed-forward network is free of back-loops. Therefore, in order to reduce prediction error, we often employ

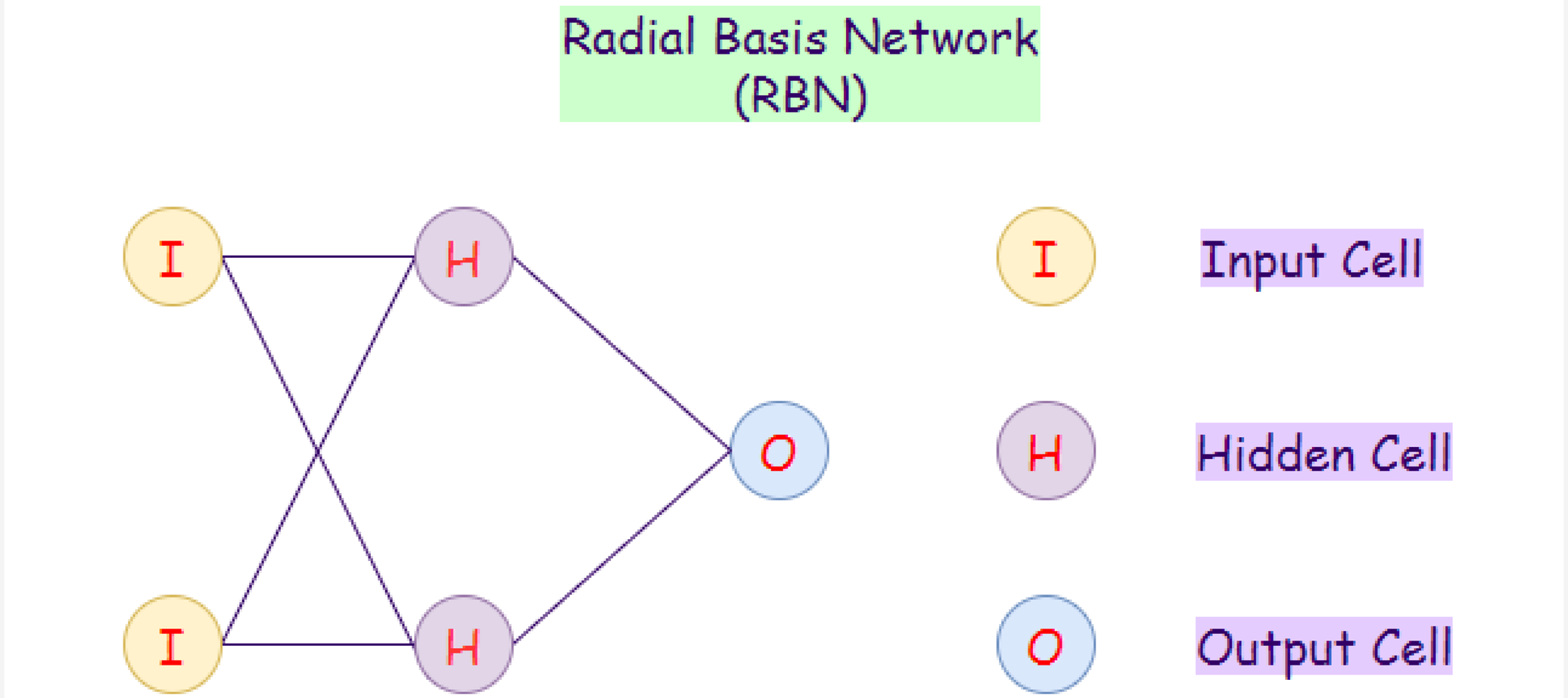
Feed Forward(FF)



Applications:

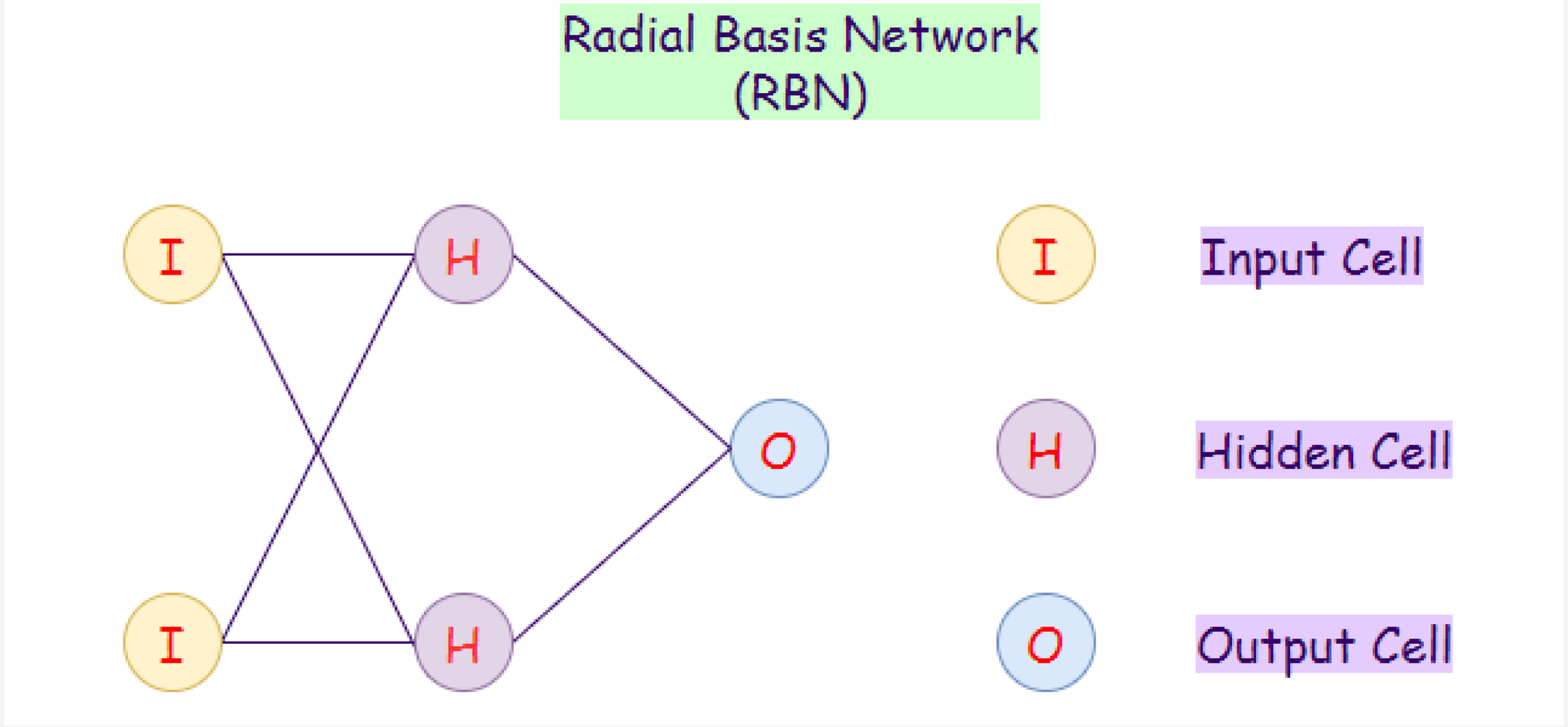
- Data Compression.
- Pattern Recognition.
- Computer Vision.
- Sonar Target Recognition.
- Speech Recognition.
- Handwritten Characters Recognition.

Radial Basis Network (RBN)



For situations involving function approximation, radial basis function networks are typically employed. They stand out from other neural networks due to their universal approximation and quicker learning rate. Radial Basis Networks (RBNs) employ a Radial Basis Function as an activation function, which is the primary distinction between RBNs and Feed-forward networks. If the answer is yes or no, a logistic function (sigmoid function) outputs a value between 0 and 1. The issue with this is that an RBN cannot be utilized if we have continuous data. The distance between our generated and target outputs is measured by RBIs. In the case of continuous values, they can be quite beneficial. In conclusion, RBIs operate like FF networks by employing various activation functions.

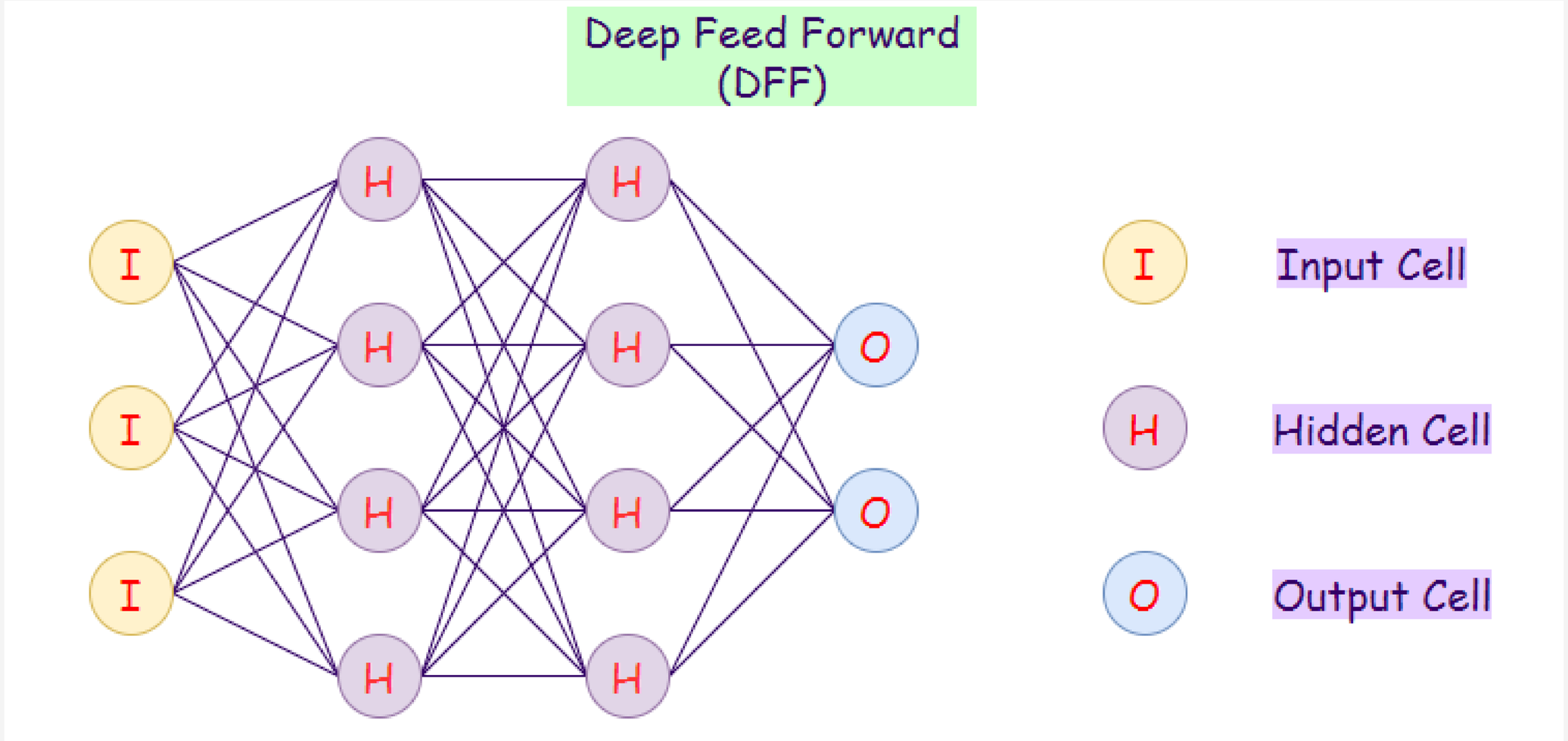
Radial Basis Network (RBN)



Applications:

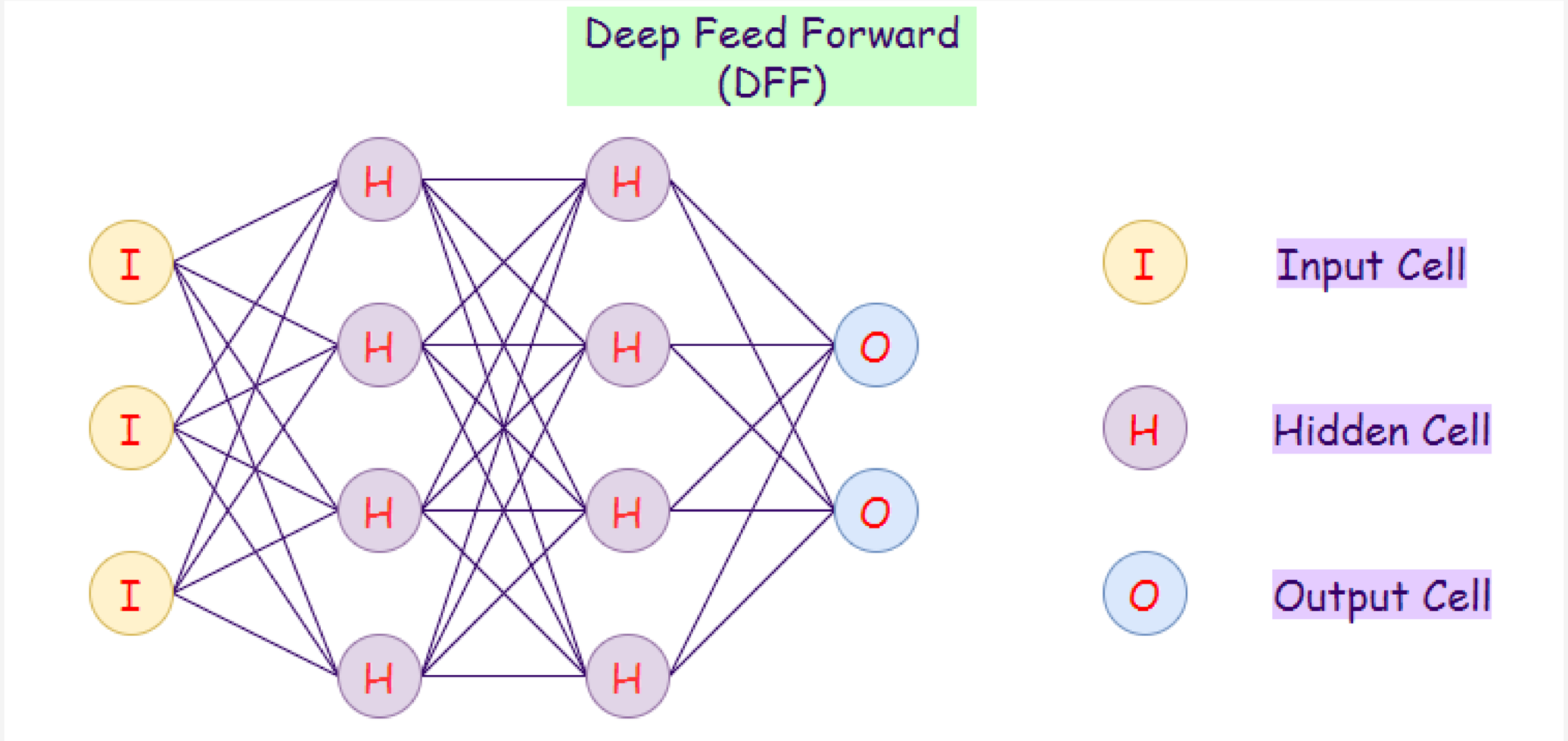
- Function Approximation.
- Timeseries Prediction.
- Classification.
- System Control.

Deep Feed-forward (DFF)



A feed-forward network that employs many hidden layers is referred to as a deep feed-forward network. Overfitting is the fundamental issue with employing only one hidden layer; consequently, by incorporating additional hidden layers, we may (though not always) lessen overfitting and increase generalization.

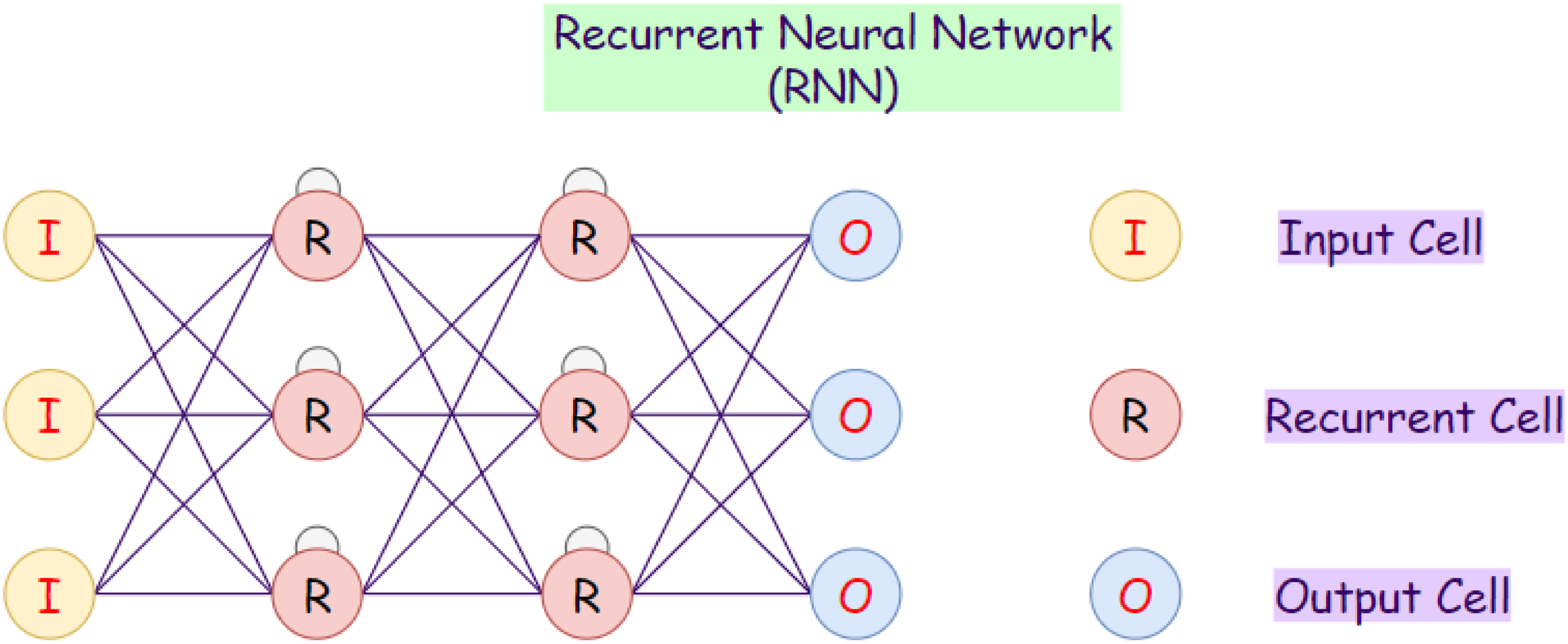
Deep Feed-forward (DFF)



Applications:

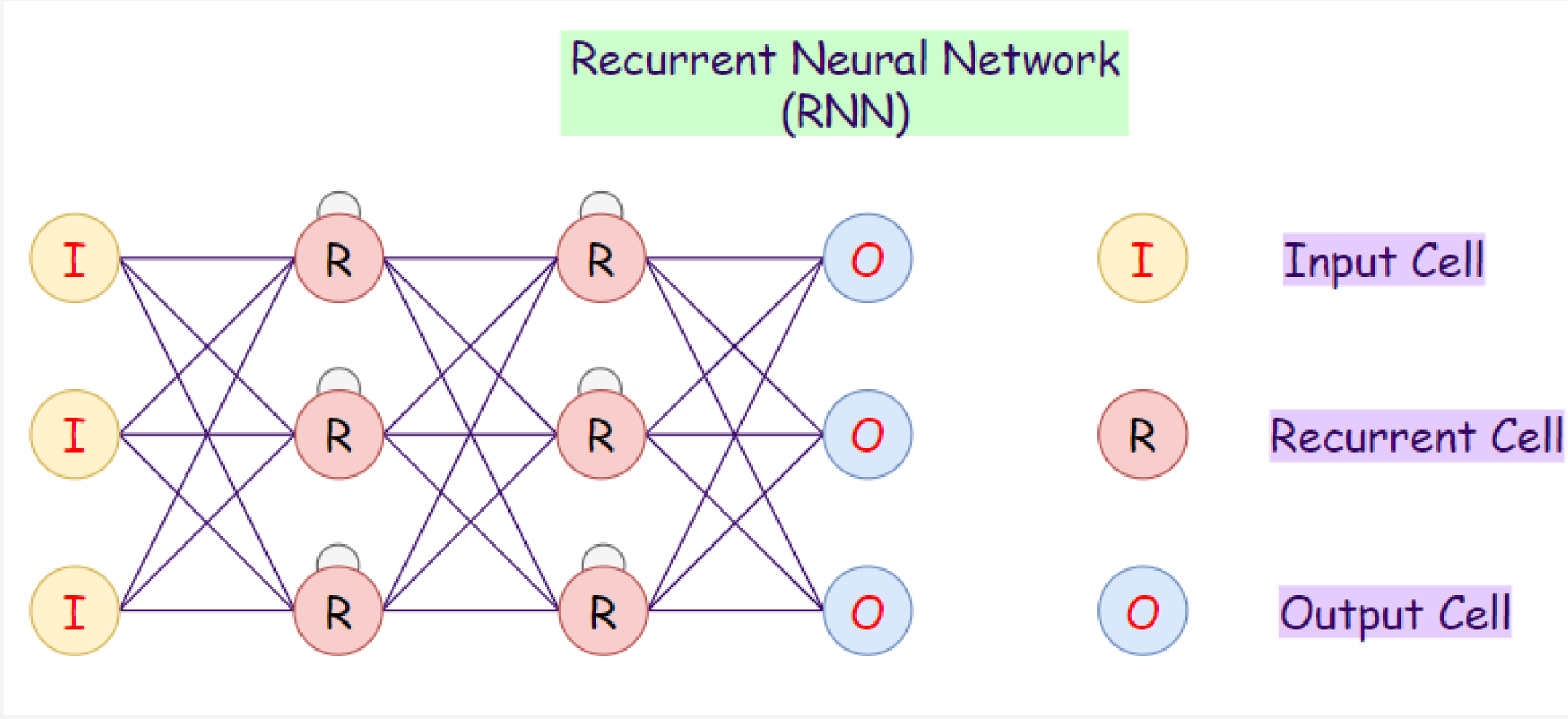
- Data Compression.
- Pattern Recognition.
- Computer Vision.
- ECG Noise Filtering.
- Financial Prediction.

Recurrent Neural Network



Feed-forward (FF) networks include a version known as recurrent neural networks (RNNs). In this kind, each hidden layer neuron gets an input with a certain time delay. This kind of neural network is used when iterative processes require access to historical data. For instance, in order to anticipate the subsequent word in a phrase, we must first be aware of the words that came before it. RNNs are capable of processing inputs and sharing weights and lengths across time. The computations in this model take into consideration the past data, and the model size does not increase with the size of the input. The sluggish computing performance of this neural network is the issue, though.

Recurrent Neural Network



Applications:

- Machine Translation.
- Robot Control.
- Time Series Prediction.
- Speech Recognition.
- Speech Synthesis.
- Time Series Anomaly Detection.
- Rhythm Learning.
- Music Composition.

Download PDF from the Description

Stay tuned for next update!

Reference - https://bit.ly/3hocWBi