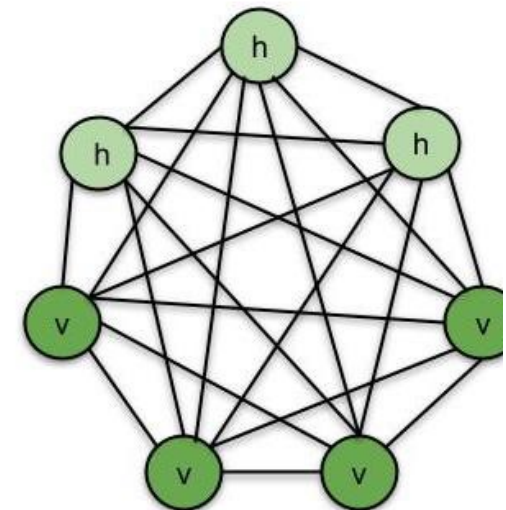# What is a Boltzmann Machine?

A Boltzmann Machine is a type of stochastic recurrent neural network that can be used to learn complex distributions. It is named after the Austrian physicist Ludwig Boltzmann, who made substantial contributions to the field of statistical mechanics, upon which the principles of Boltzmann Machines are based. The network consists of units that make stochastic decisions about whether to be on or off. These units have connections between them, and each connection has an associated weight that determines the strength and sign of the connection.

Structure of a Boltzmann Machine

Boltzmann Machines have a simple structure composed of units (**also called nodes or neurons**) and symmetrically weighted connections between them. Unlike feedforward neural networks, Boltzmann Machines are fully connected: each unit is connected to every other unit. This allows the network to capture complex relationships between variables. There are two types of units in a Boltzmann Machine: *visible units*, which are used to input and output data, and *hidden units*, which capture the structure of the data.

Types of Boltzmann Machines:

1. Restricted Boltzmann Machines (RBMs)
2. Deep Belief Networks (DBNs)
3. Deep Boltzmann Machines (DBMs)