**SOM**

**Important links:**

[**https://towardsdatascience.com/self-organizing-maps-ff5853a118d4**](https://towardsdatascience.com/self-organizing-maps-ff5853a118d4)

<https://www.cs.hmc.edu/~kpang/nn/som.html>

[**https://users.ics.aalto.fi/jhollmen/dippa/node9.html**](https://users.ics.aalto.fi/jhollmen/dippa/node9.html)

**Introduction:**

Self Organizing Map (SOM) is basically used for pattern recognition. It was built by inspiration that brain also has organized areas for different types of neural senses. It belongs to the competitive learning algorithms class. It simply recognizes the spatially related areas of input and organizes them on a paper like map. For example: if we give an input of world data, then it can highlight the poor and prosperous states or areas of world or it can rearrange the countries of the world according their financial situations.

**Technical Details:**

It is basically unsupervised model of neural network. This model was basically designed for the multidimensional dataset because it converts multi-attributed data into 2D space (hidden layer) neurons. One neuron is a vector known as codebook vector. These multi-dimensional units can have different shapes i.e. rectangular, hexagonal etc. During the training process, the weights are adjusted. Data must be preprocessed according to the requirement because none of the models is applicable to all types of data. Unlike the weights in other neural network architecture, the weights in this model denote the spatial location of the specific node within the hidden layer respective to the nodes of input layer. So during training, Best Matching Unit (BMU) is find based on the minimum distance from the input units and in this way, complete hidden layer is adjusted spatially. During all this process, the input space topology is preserved means that the neighbors of a vector in input will remain neighbors in resulted Self Organizing Map (SOM).