**Multiple Sequences Learning**

**Highlighted Points -**

1. The Hierarchical Temporal Memory (HTM)
2. Spatial Pooler
3. To optimize the sequence learning behaviour of spatial pooler and temporal memory layer in dependence on HTM Sparsity
4. The sequence learning behaviour of spatial pooler and temporal memory layer in dependence on learning parameter-Cells per Column
5. Improve HTM Spatial Pooler with Homeostatic Plasticity Control

**Hierarchical Temporal Memory**

Encoder -

Encoder is chosen according to the type of the inputs. There are some encoders available for popular input type:

- Scalar Encoder

- Datetime Encoder

- Boolean Encoder

- Category Encoder

- Geo-Spatial Encoder

In this example, Scalar Encoder is preferred as inputs are all numbers. The encoder is instantiated with predefined settings. The inputs will be encoded as series of '0's and '1's so that the spatial pooler will understand and proceed with its own computation.

HTM consists of 2 different components: Spatial Pooler and Temporal Memory.

1. Spatial Pooler -

Encoder produces output to be fed into Spatial Pooler algorithm. Type of Spatial Pooler (SP) that is used in this example is the multithreaded version that utilize multicore of the machine to run the spatial pooler algorithm.

SpatialPoolerMT spatialPooler = new SpatialPoolerMT(hpa);

patialPooler.Init(memory, UnitTestHelpers.GetMemory());

1. Temporal Memory -

The output of Spatial Pooler (SDR) is used as the input of Temporal Memory.Temporal memory algorithm will then learn the temporal pattern from spatial pattern.

TemporalMemory temporalMemory = new TemporalMemory();

temporalMemory.Init(mem);