Triadic Memory Capacity

Store 1 million random triples in a triadic memory and test retrieval accuracy.

The configuration used in this test is n=1000 and p=10.

Initialization

```
Get[ $UserBaseDirectory <> "/TriadicMemory/triadicmemoryC.m"]
```

```
TriadicMemory[M, {1000, 10}];
```

Generate test data: k random triples {x,y,z}

```
k = 1 000 000;
```

```
data = Table[ {M[], M[], M[]}, k];
```

Store test data in memory

```
M @@@ data; // AbsoluteTiming
```

```
{127.854, Null}
```

Recall all z and calculate the retrieval accuracy

```
out = M[#[[1]], #[[2]], _] & /@ data; // AbsoluteTiming
```

```
{408.574, Null}
```

```
Table[ HammingDistance[out[[i]], data[[i, 3]]],
   {i, 1, Length[data]}] // Tally // Sort
```

```
{{0, 1 000 000}}
```

Recall all y and calculate the retrieval accuracy

```
out = M[#[[1]], _, #[[3]]] & /@ data; // AbsoluteTiming
```

```
{1024.14, Null}
```

```
Table[ HammingDistance[out[[i]], data[[i, 2]]], {i, 1, Length[data]}] // Tally
```

```
{{0, 999 997}, {2, 3}}
```

Recall all x and calculate the retrieval accuracy

```
out = M[_, #[[2]], #[[3]]] & /@ data; // AbsoluteTiming
```

```
{1234.81, Null}
```

```
Table[ HammingDistance[out[[i]], data[[i, 1]]], {i, 1, Length[data]}] // Tally
```

```
{{0, 999 999}, {2, 1}}
```