# Generalized Halton Module

***Release 0.6.1***

**Oct 04, 2020**

# Contents

**class** ghalton.**GeneralizedHalton**(*dim[, seed]* | *config*)

Creates a generalized Halton generator. It takes at least one argument, either the dimensionality, or a configuration. When the dimensionality is given, an optional argument can be used to seed for the random permutations created. The configuration is a series of permutations each of *n_i* numbers, where *n_i* is the *n_i*'th prime number. In that last case, the dimensionality is infered from the number of sublists given.

**Parameters**

- **dim** (*integer*) – Dimensionality of the points to create
- **seed** (*integer*) – Seed to create the permutations
- **config** (*list of lists of integers*) – List of permutations to scramble the halton digits

**get**(*n*)

Retreive the *n* next points from this sequence. Each point is a `list` containing each value for each coordinates and the points are returned in a `list` of *n* elements even if *n* is 1.

**reset**()

Reset the generator to its initial state, i.e. before it generated the first point.

**seed**([*config*])

Seed the generator with a new seed or configuration. Seeding a generator automatically call *reset()*.

**Parameters** **config** (None, integer, or list of lists of integers) – The config to seed the sequencer

**class** ghalton.**Halton**(*dim*)

Creates a Halton generator of dimensionality *dim*. This is similar to creating a *GeneralizedHalton* sequence with the identity permutations.

**get**(*n*)

Retreive the *n* next points from this sequence. Each point is a `list` containing each value for each coordinates and the points are returned in a `list` of *n* elements even if *n* is 1.

**reset**()

Reset the generator to its initial state, i.e. before it generated the first point.

ghalton.**EA_PERMS**

Permutations described in [DeRainville2012] for the 100 first dimensions of the Generalized Halton sequence.

ghalton.**PRIMES**

Prime numbers lower than 10000.

# Bibliography

[DeRainville2012] F.-M. De Rainville, C. Gagné, O. Teytaud, D. Laurendeau. *Evolutionary optimization of low-discrepancy sequences.* ACM Trans. Model. Comput. Simul., 22(2):1-25, 2012.

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