API Reference

Welcome to the API documentation for the **BelNytheraSeiche.WaveletMatrix** library. This library is organized into several key components that work together to provide powerful sequence and text analysis capabilities.

Below is an overview of the main classes and their roles.

Core Data Structures

These are the fundamental building blocks of the library.

• WaveletMatrixGeneric

The main generic class for creating a Wavelet Matrix from any IComparable<T> sequence. It handles coordinate compression and provides a rich set of query APIs.

WaveletMatrixCore

The high-performance, non-generic engine that powers the WaveletMatrixGeneric<T>. It operates directly on integer sequences.

<u>FischerHeunSparseTable</u>

Helper data structure used for answering Range Minimum/Maximum Queries (RMQ) in O(1) time, respectively. This is used internally by LcpIndex.

Text Analysis Components

These classes are specialized for advanced stringology and full-text search.

• SuffixArray

The foundational class for most text analysis. It builds a Suffix Array and LCP Array from a given text, enabling fast substring searches.

LcpIndex

An index built on top of a SuffixArray that provides advanced O(1) LCP queries. This is the key to complex analyses like finding tandem repeats or calculating string complexity.

FMIndex

The high-level, all-in-one full-text search index. It combines the power of the WaveletMatrix, SuffixArray, and Burrows-Wheeler Transform to offer extremely fast pattern counting (Count) and

locating (Locate).

• <u>BurrowsWheelerTransform</u>

A static utility class that performs the Burrows-Wheeler Transform, a key step in building the FMIndex.