

# Twined Language Specification

Lucas Weissman

Zach Sturdevant

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## Introduction

"Twined" represents a transformative approach in how we manage and interact with textual information. By converting unstructured text data from diverse note-taking formats into structured, navigable knowledge graphs, "Twined" provides a unique visual perspective that enhances comprehension and analysis.

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Brainstorming Section:

"Twined" intertwines user's information by managing and interacting with textual information. It converts unstructured text data from various note-taking formats into structured, navigable knowledge graphs. This will allow users to quickly visualize connections and gain insights that might be missed in traditional textual data formats.

## Design Principles

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Brainstorming Section:

Rules: Graph Rule:  $x, y, x, z \rightarrow x, z, x, w, y, w, z, w$  Hypergraph Rule:  $x, y, z \rightarrow x, u, v, z, v, w, y, w, u$

Examples: graph: Sunlight,Plant Growth,Water,Plant Growth,Soil Nutrients,Plant Growth hypergraph: Sunlight,Water,Soil Nutrients,Plant Growth,Temperature,Humidity,Water,Plant Growth

A hypergraph is defined as a collection of nodes and hyperedges, where each hyperedge has the capability to connect three or more nodes, unlike traditional graphs where edges connect only two nodes. In terms of mathematical representation, edges in standard graphs are noted as pairs of numbers within curly brackets, such as  $\{1, 2\}$ . Conversely, in hypergraphs, hyperedges that connect multiple nodes are denoted by three or more numbers within curly brackets, for example,  $\{1, 2, 3\}$ . Visually, in graphs, edges are depicted as connections between white dots (nodes) using white arrows (edges). Hypergraphs extend this visualization by linking three or more white dots (nodes) with multiple arrows and a transparent white web, highlighting the complex relationships between nodes.

## Examples

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Brainstorming Section

## Language Concepts

The language concepts behind "Twined" incorporate elements from graph theory and data visualization to support the creation of knowledge graphs and hypergraphs. These concepts are integral in defining how textual data is parsed, how entities within the text are identified as nodes, and how relationships (edges) are established based on the context and content of the data. This allows "Twined" to dynamically interpret and display information in a way that highlights both hierarchical and associative relationships.

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Brainstorming Section

Terms to be used/contextualized: Graph Theory Data Visualization Knowledge Graphs Hypergraphs Parsing Nodes Edges Hierarchical Relationships Associative relationships

## Formal Syntax

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Brainstorming Section

## Semantics

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Brainstorming Section