The Lexicographic Quartet

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Abstract. Semantics is not the sole foundation of lexicography. The syntagmatic and paradigmatic components of any vocabulary are inseparably contiguous. Three requisites, all together enclosing a solution space that satisfies the ambition to actualize the "ultimate destiny" of our World Wide Web: a Giant Global Graph.

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1 Contiguous Components

1.1 Material-Semiotic Punctualization

Relationships between words and their meanings (or between resources and their traits) can be described semantically, but only after addressing the Problem of Universals presented by semiotics.

References epitomize data through punctualization. Dereferencing proves existence in *an* ontology, but not *which* ontology, introducing risk of misinterpretation. This paper proposes a finite set (10^{20}) of chronological indices inside a finite set (10^{20}) of domains for referencing material-semiotic datapoints.

Generally Unique Time Stamp (Primary Key). A twenty-digit integer representing a datetime in the format YYYYMMDDHHMMSSNNNNNN. It serves as the chronological address of every individual quad, prepending its semantic triple.

1.2 Inquisitive Simplices

Arrangement of constituent lexical elements can effectuate sorting and ordering of subjects and objects. By rearranging (without or without weighted ranking) into groups, it's possible to prove intrinsic properties, but not extrinsic typing. Computed perceptions are typable. Contrived syntagmata are not.

This paper proposes four simplex types over an unbounded set of complex arrangements. The typed simplices offer a sufficient response to inquiries of who, what, when, where, why, and how.

Boolean (0-simplex). One binary digit with two possible values. Measures validity. Can convey yes/no.

Whole Integer (1-simplex). One natural ($\mathbb{N}$) number with infinite ($\aleph_1$) possible values. Measures quantity. Can convey ordinality.

Decimal Double (2-simplex). One pair of whole integers. Measures ratio. Can convey percentage.

Real Matrix (3-simplex). One rectangular array of elements. Stores one or more sets. Can convey encoded data.

1.3 Associative Significance

Formulating a lexicographic framework for communication and reasoning (between LLM's and explicit knowledge graphs, or otherwise) would define the exemplary concepts and practices for members of that discipline. "*Such a paradigm does not impose a rigid or mechanical approach, but can be taken more or less creatively and flexibly.*" [1].

This paper proposes delimited quads as a sufficient data structure for implementing directly addressed associative arrays.

Sequential Discretion. A semantic triple, by virtue of being, is a sequence of subject, predicate, and object, relatively positioned. If the set does not match this generic pattern, the nomenclature is invalid. A semantic quad, likewise, takes the form [$1 $2 $3 $4] when it is a sequence of timestamp, subject, predicate, and object. There are fourteen other equivalency patterns possible. Each is ambiguous, unless defined.

This paper proposes the lexicographic quartet, specified by a discretionary grammar taking the form [$1 $1 $1 $1]. In addition to the semantic quad, otherwise ambiguous sequences are concretely defined by the grammar.

Table 1. Fifteen possible connotations of equivalency patterns from a quartet.

Pattern	Implication	Equivalency Sets
$1 $1 $1 $1	$1 is synonymous with a grammar	{1, 2, 3, 4}
$1 $1 $1 $2	$1 is synonymous with a signature; $2 is a signatory	{1, 2, 3} {4}
$1 $1 $2 $1	$1 is synonymous with a subset of $2	{1, 2, 4} {3}
$1 $1 $2 $2	$1 is synonymous with a superset of $2	{1, 2} {3, 4}
$1 $2 $1 $1	$2 is conflicted (NOT OK) as of timestamp $1	{1, 3, 4} {2}
$1 $2 $1 $2	$2 is unconflicted (OK) as of timestamp $1	{1, 3} {2, 4}
$1 $2 $2 $1	A subscription to $2 commences as of timestamp $1	{1, 4} {2, 3}

$1 $2 $2 $2	A subscription to $2 concludes as of timestamp $1	{1} {2, 3, 4}
$1 $1 $2 $3	$1 is an index of $2; $2 is a subset of $3	{1, 2} {3} {4}
$1 $2 $1 $3	$2 is an alias of $3 as of timestamp $1	{1, 3} {2} {4}
$1 $2 $2 $3	$3 is the handle of $2 as of timestamp $1	{1} {2, 3} {4}
$1 $2 $3 $1	Trait $3 of subject $2 is unknown as of timestamp $1	{1, 4} {2} {3}
$1 $2 $3 $2	Trait $3 of subject $2 is revealed as of timestamp $1	{1} {2, 4} {3}
$1 $2 $3 $3	Trait $3 of subject $2 is concealed as of timestamp $1	{1} {2} {3, 4}
$1 $2 $3 $4	Trait $3 of subject $2 is valued $4 as of timestamp $1	{1} {2} {3} {4}

Set {1, 2, 3, 4}. A grammatic specification.

Set {1, 2, 3} {4}. Discretionary. In this example, a signature.

Set {1, 2, 4} {3}. Discretionary. In this example, a subset (or table).

Set {1, 2} {3, 4}. Discretionary. In this example, a superset (or schema).

Set {1, 3, 4} {2}. Discretionary. In this example, a passing status.

Set {1, 3} {2, 4}. Discretionary. In this example, a failing status.

Set {1, 4} {2, 3}. Discretionary. In this example, an opt-in.

Set {1} {2, 3, 4}. Discretionary. In this example, an opt-out.

Set {1, 2} {3} {4}. Discretionary. In this example, an index (or column).

Set {1, 3} {2} {4}. Discretionary. In this example, a duplication.

Set {1} {2, 3} {4}. Discretionary. In this example, a nickname.

Set {1, 4} {2} {3}. Discretionary. In this example, an open question.

Set {1} {2, 4} {3}. Discretionary. In this example, a potential answer.

Set {1} {2} {3, 4}. Discretionary. In this example, a denial.

Set {1} {2} {3} {4}. A semantic quad. An assertion.

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References

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