Graphol: a graphical ontology language

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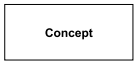
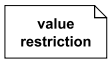
1 Syntax

1.1 Predicate nodes

Graphol expression	Meaning	OWL 2 Expression
	Concept	Class
	Role	ObjectProperty
	Attribute	DataProperty
	Value-domain	Datatype
	Individual/Value	NamedIndividual/Literal
	Value Restriction	(Constraining facet, Restriction value)

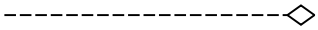
1.2 Constructor nodes

Symbol	Meaning	Symbol	Meaning
	Intersection		Union
	Domain Restriction		Range Restriction
	Complement		Role Inverse
	Enumeration		Role Chain
	Datatype Restriction		

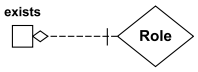
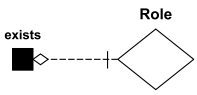
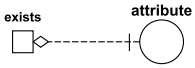
Restriction types for Domain and Range Restriction nodes:

- existential: “exists”
- universal: “forall”
- maximum cardinality: “(-,x)”
- minimum cardinality: “(x,-)”
- exact cardinality: “(x,x)”
- self: “self”

1.3 Edges

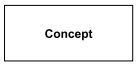
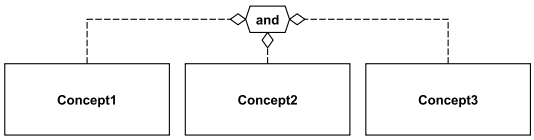
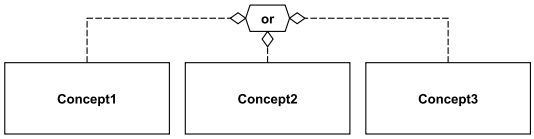
Graphical language	Meaning
	Inclusion between the expressions linked to the source and target end of the edge
	Input of a predicate or constructor node to a constructor node

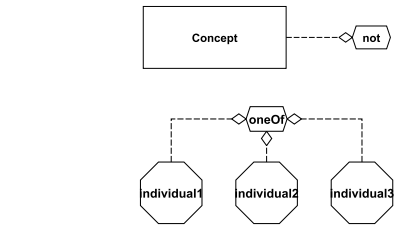
2 Graphical shortcuts

Symbol	Meaning	Symbol	Meaning
	Disjoint Union		Role Functionality
	Inverse Role Functionality		Attribute Functionality

3 Expressions

In the following table, the “Concept” and “Role” nodes in the Graphol column can be replaced with complex concepts and roles. N-ary constructors are represented in the following table as having 3 input parameters.

Graphol Expression	OWL 2 Expression
	Class
	ObjectIntersectionOf
	ObjectUnionOf

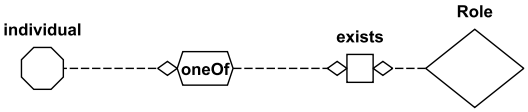


ObjectComplementOf

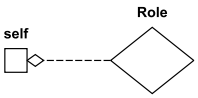
ObjectOneOf

ObjectSomeValuesFrom

ObjectAllValuesFrom



ObjectHasValue

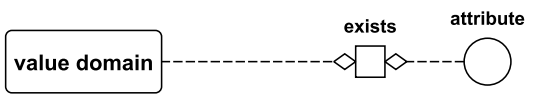


ObjectHasSelf

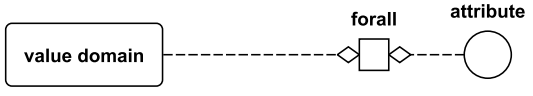
ObjectMinCardinality

ObjectMaxCardinality

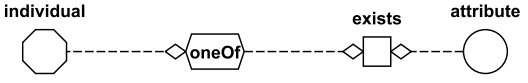
ObjectExactCardinality



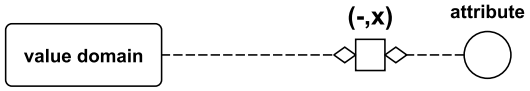
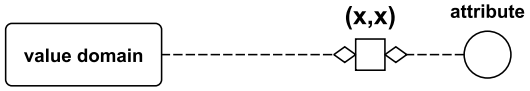
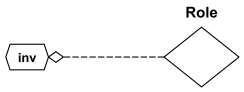
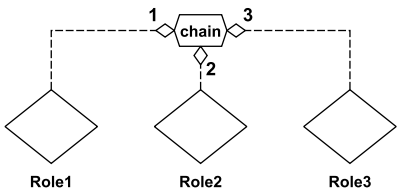
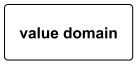
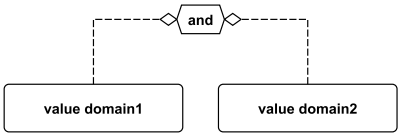
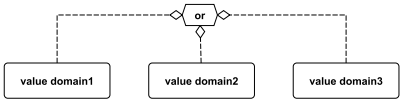
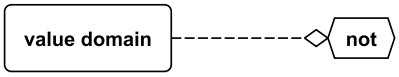
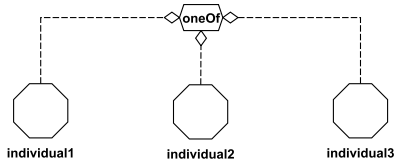
DataSomeValuesFrom

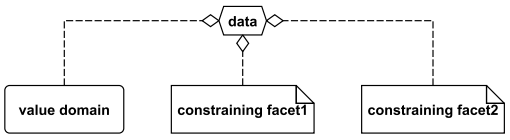


DataAllValuesFrom



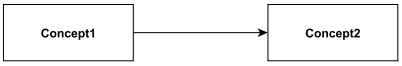
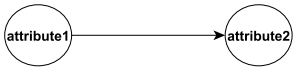
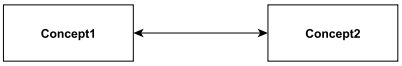
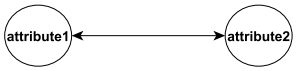
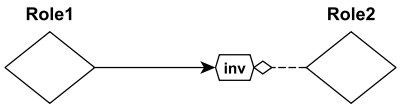
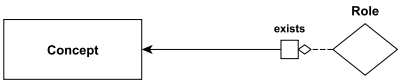
DataHasValue

	DataMinCardinality
	DataMaxCardinality
	DataExactCardinality
	ObjectProperty
	InverseObjectProperty
	ObjectPropertyChain
	Datatype
	DataIntersectionOf
	DataUnionOf
	DataComplementOf
	DataOneOf

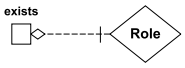
	DatatypeRestriction

4 Axiom Examples

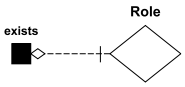
In the following table, the "Concept" and "Role" nodes in the Graphol column can be replaced with complex concepts and roles.

Graphol Assertion	OWL 2 Axiom
	SubClassOf
	SubObjectPropertyOf
	SubDataPropertyOf
	EquivalentClasses
	EquivalentObjectProperties
	EquivalentDataProperties
	DisjointClasses
	InverseObjectProperties
	ObjectPropertyDomain
	ObjectPropertyRange
	DataPropertyDomain

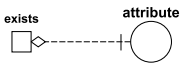
DataPropertyRange



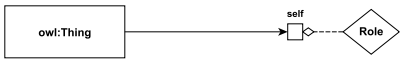
FunctionalObjectProperty



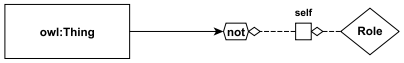
InverseFunctionalObjectProperty



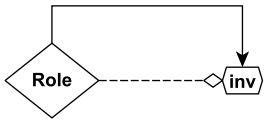
FunctionalDataProperty



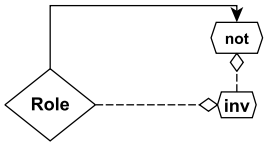
ReflexiveObjectProperty



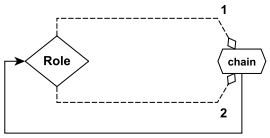
IrreflexiveObjectProperty



SimmetricObjectProperty



AsymmetricObjectProperty



TransitiveObjectProperty