

# Description logic view: DOLCE-Lite

## Classes

### abstract

abstract  $\sqsubseteq \forall$  has-quality  $\neg$ temporal-location\_q  
abstract  $\sqsubseteq$  particular  
abstract  $\sqsubseteq \forall$  has-quality  $\neg$ spatial-location\_q  
abstract  $\sqsubseteq \neg$  perdurant  
abstract  $\sqsubseteq \neg$  quality  
abstract  $\sqsubseteq \neg$  endurant

### abstract-quality

abstract-quality  $\sqsubseteq$  quality  
abstract-quality  $\sqsubseteq \forall$  q-location abstract-region  
abstract-quality  $\sqsubseteq \forall$  has-quality abstract-quality  
abstract-quality  $\sqsubseteq \exists$  inherent-in non-physical-endurant  
abstract-quality  $\sqsubseteq \neg$  physical-quality  
abstract-quality  $\sqsubseteq \neg$  temporal-quality

### abstract-region

abstract-region  $\sqsubseteq \forall$  part abstract-region  
abstract-region  $\sqsubseteq$  region  
abstract-region  $\sqsubseteq \forall$  q-location-of abstract-quality  
abstract-region  $\sqsubseteq \neg$  temporal-region  
abstract-region  $\sqsubseteq \neg$  physical-region

### accomplishment

accomplishment  $\sqsubseteq$  event

### achievement

achievement  $\sqsubseteq$  event

### amount-of-matter

amount-of-matter  $\sqsubseteq$  physical-endurant  
amount-of-matter  $\sqsubseteq \neg$  feature  
amount-of-matter  $\sqsubseteq \neg$  physical-object

### arbitrary-sum

arbitrary-sum  $\sqsubseteq \exists$  part endurant  
arbitrary-sum  $\sqsubseteq$  endurant

arbitrary-sum  $\sqsubseteq \neg$  physical-endurant  
arbitrary-sum  $\sqsubseteq \neg$  non-physical-endurant

### **dependent-place**

dependent-place  $\sqsubseteq$  feature

### **endurant**

endurant  $\sqsubseteq \forall$  part endurant  
endurant  $\sqsubseteq$  spatio-temporal-particular  
endurant  $\sqsubseteq \exists$  participant-in perdurant  
endurant  $\sqsubseteq \forall$  specific-constant-constituent endurant  
endurant  $\sqsubseteq \neg$  quality  
endurant  $\sqsubseteq \neg$  perdurant  
endurant  $\sqsubseteq \neg$  abstract

### **event**

event  $\sqsubseteq$  perdurant

### **feature**

feature  $\sqsubseteq$  physical-endurant  
feature  $\sqsubseteq \exists$  host physical-endurant  
feature  $\sqsubseteq \neg$  amount-of-matter  
feature  $\sqsubseteq \neg$  physical-object

### **non-physical-endurant**

non-physical-endurant  $\sqsubseteq \forall$  has-quality abstract-quality  
non-physical-endurant  $\sqsubseteq \forall$  part non-physical-endurant  
non-physical-endurant  $\sqsubseteq$  endurant  
non-physical-endurant  $\sqsubseteq \neg$  physical-endurant  
non-physical-endurant  $\sqsubseteq \neg$  arbitrary-sum

### **non-physical-object**

non-physical-object  $\sqsubseteq \forall$  part non-physical-object  
non-physical-object  $\sqsubseteq$  non-physical-endurant  
non-physical-object  $\sqsubseteq \exists$  generically-dependent-on physical-endurant

### **particular**

#### **perdurant**

perdurant  $\sqsubseteq$  spatio-temporal-particular  
perdurant  $\sqsubseteq \forall$  has-quality temporal-quality

perdurant  $\sqsubseteq \forall$  specific-constant-constituent perdurant  
perdurant  $\sqsubseteq \forall$  part perdurant  
perdurant  $\sqsubseteq \exists$  has-quality temporal-location\_q  
perdurant  $\sqsubseteq \exists$  participant endurant  
perdurant  $\sqsubseteq \neg$  abstract  
perdurant  $\sqsubseteq \neg$  endurant  
perdurant  $\sqsubseteq \neg$  quality

### **physical-endurant**

physical-endurant  $\sqsubseteq \exists$  has-quality spatial-location\_q  
physical-endurant  $\sqsubseteq \exists$  has-quality physical-quality  
physical-endurant  $\sqsubseteq \forall$  has-quality physical-quality  
physical-endurant  $\sqsubseteq$  endurant  
physical-endurant  $\sqsubseteq \forall$  specific-constant-constituent physical-endurant  
physical-endurant  $\sqsubseteq \forall$  part physical-endurant  
physical-endurant  $\sqsubseteq \neg$  non-physical-endurant  
physical-endurant  $\sqsubseteq \neg$  arbitrary-sum

### **physical-object**

physical-object  $\sqsubseteq$  physical-endurant  
physical-object  $\sqsubseteq \neg$  amount-of-matter  
physical-object  $\sqsubseteq \neg$  feature

### **physical-quality**

physical-quality  $\sqsubseteq$  quality  
physical-quality  $\sqsubseteq \forall$  has-quality physical-quality  
physical-quality  $\sqsubseteq \exists$  inherent-in physical-endurant  
physical-quality  $\sqsubseteq \forall$  q-location physical-region  
physical-quality  $\sqsubseteq \neg$  abstract-quality  
physical-quality  $\sqsubseteq \neg$  temporal-quality

### **physical-region**

physical-region  $\sqsubseteq$  region  
physical-region  $\sqsubseteq \forall$  part physical-region  
physical-region  $\sqsubseteq \forall$  q-location-of physical-quality  
physical-region  $\sqsubseteq \neg$  temporal-region  
physical-region  $\sqsubseteq \neg$  abstract-region

### **process**

process  $\sqsubseteq$  stative

**proposition**

proposition  $\sqsubseteq$  abstract

**quale**

quale  $\equiv$  region  $\sqcap$   $\exists$  atomic-part-of region

**quality**

quality  $\sqsubseteq$  spatio-temporal-particular

quality  $\sqsubseteq$   $\exists$  inherent-in particular

quality  $\sqsubseteq$   $\neg$  enduring

quality  $\sqsubseteq$   $\neg$  abstract

quality  $\sqsubseteq$   $\neg$  perdurant

**quality-space**

quality-space  $\equiv$  region  $\sqcap$   $\forall$  overlaps  $\neg$ quality-space

**region**

region  $\sqsubseteq$   $\forall$  part region

region  $\sqsubseteq$  abstract

**relevant-part**

relevant-part  $\sqsubseteq$  feature

**set**

set  $\sqsubseteq$  abstract

**space-region**

space-region  $\sqsubseteq$   $\forall$  q-location-of spatial-location<sub>q</sub>

space-region  $\sqsubseteq$   $\forall$  part space-region

space-region  $\sqsubseteq$  physical-region

**spatial-location<sub>q</sub>**

spatial-location<sub>q</sub>  $\sqsubseteq$  physical-quality

**spatio-temporal-particular**

spatio-temporal-particular  $\equiv$  particular  $\sqcap$  enduring  $\sqcup$  perdurant  $\sqcup$  quality

### **spatio-temporal-region**

spatio-temporal-region  $\sqsubseteq$  space-region

### **state**

state  $\sqsubseteq$  stative

### **stative**

stative  $\sqsubseteq$  perdurant

### **temporal-location<sub>q</sub>**

temporal-location<sub>q</sub>  $\sqsubseteq$  temporal-quality

### **temporal-quality**

temporal-quality  $\sqsubseteq$  quality

temporal-quality  $\sqsubseteq \forall$  has-quality temporal-quality

temporal-quality  $\sqsubseteq \exists$  inherent-in perdurant

temporal-quality  $\sqsubseteq \forall$  q-location temporal-region

temporal-quality  $\sqsubseteq \neg$  abstract-quality

temporal-quality  $\sqsubseteq \neg$  physical-quality

### **temporal-region**

temporal-region  $\sqsubseteq \forall$  q-location-of temporal-quality

temporal-region  $\sqsubseteq \forall$  part temporal-region

temporal-region  $\sqsubseteq$  region

temporal-region  $\sqsubseteq \neg$  physical-region

temporal-region  $\sqsubseteq \neg$  abstract-region

### **time-interval**

time-interval  $\sqsubseteq$  temporal-region

## **Object properties**

### **abstract-location**

$\sqsubseteq$  exact-location

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl#abstract-location]} \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.location-of]}^{-}$

$\exists$  abstract-location Thing  $\sqsubseteq$  non-physical-endurant

$\top \sqsubseteq \forall$  abstract-location abstract-region

### **abstract-location-of**

$\sqsubseteq$  exact-location-of

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlabstract-location}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.location-of}_i^-$

$\exists$  abstract-location-of Thing  $\sqsubseteq$  abstract-region

$\top \sqsubseteq \forall$  abstract-location-of non-physical-endurant

### **atomic-part**

$\sqsubseteq$  part

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlatomic-part-of}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.part}_i^-$

$\exists$  atomic-part Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  atomic-part particular

### **atomic-part-of**

$\sqsubseteq$  part-of

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlatomic-part-of}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.part}_i^-$

$\exists$  atomic-part-of Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  atomic-part-of particular

### **boundary**

$\sqsubseteq$  proper-part

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlboundary}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlbound}_i^-$

$\exists$  boundary Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  boundary particular

### **boundary-of**

$\sqsubseteq$  proper-part-of

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlboundary}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlbound}_i^-$

$\exists$  boundary-of Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  boundary-of particular

### **constant-participant**

$\sqsubseteq$  participant

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlconstant-participant-in}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.constant-participant}_i^-$

$\exists$  constant-participant Thing  $\sqsubseteq$  perdurant

$\top \sqsubseteq \forall$  constant-participant endurant

### **constant-participant-in**

$\sqsubseteq$  participant-in

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlconstant-participant-in}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlparticipant}_i^-$

$\exists$  constant-participant-in Thing  $\sqsubseteq$  endurant

$\top \sqsubseteq \forall$  constant-participant-in perdurant

### **exact-location**

$\sqsubseteq$  generic-location

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlexact-location-of}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owllocation}_i^-$

$\exists$  exact-location Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  exact-location region

### **exact-location-of**

$\sqsubseteq$  generic-location-of

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlexact-location-of}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owllocation}_i^-$

$\exists$  exact-location-of Thing  $\sqsubseteq$  region

$\top \sqsubseteq \forall$  exact-location-of particular

### **generic-constituent**

$\sqsubseteq$  immediate-relation

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlgeneric-constituent-of}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlconstituent}_i^-$

$\exists$  generic-constituent Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  generic-constituent particular

### **generic-constituent-of**

$\sqsubseteq$  immediate-relation-i

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlgeneric-constituent-of}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlconstituent}_i^-$

$\exists$  generic-constituent-of Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  generic-constituent-of particular

### **generic-dependent**

$\sqsubseteq$  immediate-relation

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlgenerically-dependent-on}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlgeneric-dependent}_i^-$

$\exists$  generic-dependent Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  generic-dependent particular

### **generic-location**

$\sqsubseteq$  mediated-relation  
 $\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlgeneric-location]}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.o}$   
 $\text{location-of}_i^-$   
 $\exists$  generic-location Thing  $\sqsubseteq$  particular  
 $\top \sqsubseteq \forall$  generic-location particular

### **generic-location-of**

$\sqsubseteq$  mediated-relation-i  
 $\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlgeneric-location]}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.o}$   
 $\text{location-of}_i^-$   
 $\exists$  generic-location-of Thing  $\sqsubseteq$  particular  
 $\top \sqsubseteq \forall$  generic-location-of particular

### **generically-dependent-on**

$\sqsubseteq$  immediate-relation-i  
 $\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlgenerically-dependent-on]}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOL}$   
 $\text{Lite.owlgeneric-dependent}_i^-$   
 $\exists$  generically-dependent-on Thing  $\sqsubseteq$  particular  
 $\top \sqsubseteq \forall$  generically-dependent-on particular

### **has-quale**

$\sqsubseteq$  q-location  
 $\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlhas-quale]}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlqu}$   
 $\text{of}_i^-$   
 $\exists$  has-quale Thing  $\sqsubseteq$  quality  
 $\top \sqsubseteq \forall$  has-quale quale

### **has-quality**

$\sqsubseteq$  immediate-relation-i  
 $\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlinherent-in]}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlha}$   
 $\exists$  has-quality Thing  $\sqsubseteq$  particular  
 $\top \sqsubseteq \forall$  has-quality quality

### **has-t-quality**

$\sqsubseteq$  has-quality  
 $\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlt-inherent-in]}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl}$   
 $\text{t-quality}_i^-$   
 $\exists$  has-t-quality Thing  $\sqsubseteq$  particular  
 $\top \sqsubseteq \forall$  has-t-quality quality

### host

$\sqsubseteq$  specifically-constantly-dependent-on  
 $\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlhost}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlhost-of}_i$   
 $\exists$  host Thing  $\sqsubseteq$  feature  
 $\top \sqsubseteq \forall$  host physical-endurant

### host-of

$\sqsubseteq$  specific-constant-dependent  
 $\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlhost}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlhost-of}_i$   
 $\exists$  host-of Thing  $\sqsubseteq$  physical-endurant  
 $\top \sqsubseteq \forall$  host-of feature

### identity-c

$\sqsubseteq$  immediate-relation  
 $\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlidentity-c}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owliden}$   
 $c}_i^-$   
TransitivePropertyidentity-c  
 $\exists$  identity-c Thing  $\sqsubseteq$  particular  
 $\top \sqsubseteq \forall$  identity-c particular

### identity-n

$\sqsubseteq$  immediate-relation  
 $\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlidentity-n}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owliden}$   
 $n}_i^-$   
TransitivePropertyidentity-n  
 $\exists$  identity-n Thing  $\sqsubseteq$  particular  
 $\top \sqsubseteq \forall$  identity-n particular

### immediate-relation

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlimmediate-relation-i}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-L}$   
 $\text{relation}_i^-$   
 $\exists$  immediate-relation Thing  $\sqsubseteq$  particular  
 $\top \sqsubseteq \forall$  immediate-relation particular

### immediate-relation-i

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlimmediate-relation-i}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-L}$   
 $\text{relation}_i^-$   
 $\exists$  immediate-relation-i Thing  $\sqsubseteq$  particular  
 $\top \sqsubseteq \forall$  immediate-relation-i particular

### **inherent-in**

⊆ immediate-relation

¡http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlinherent-in¡ ≡ ¡http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlha

∃ inherent-in Thing ⊆ quality

⊤ ⊆ ∀ inherent-in particular

### **life**

⊆ constant-participant-in

¡http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlife¡ ≡ ¡http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlife-of¡

∃ life Thing ⊆ endurant

⊤ ⊆ ∀ life perdurant

### **life-of**

⊆ constant-participant

¡http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlife ≡ ¡http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlife-of¡

∃ life-of Thing ⊆ perdurant

⊤ ⊆ ∀ life-of endurant

### **mediated-relation**

¡http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlmediated-relation-i¡ ≡ ¡http://www.loa-cnr.it/ontologies/DOLCE-Li  
relation¡

∃ mediated-relation Thing ⊆ particular

⊤ ⊆ ∀ mediated-relation particular

### **mediated-relation-i**

¡http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlmediated-relation-i¡ ≡ ¡http://www.loa-cnr.it/ontologies/DOLCE-Li  
relation¡

∃ mediated-relation-i Thing ⊆ particular

⊤ ⊆ ∀ mediated-relation-i particular

### **mereologically-coincides**

⊆ temporary-part

¡http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlmereologically-coincides¡ ≡ ¡http://www.loa-cnr.it/ontologies/DOL  
Lite.owlmereologically-coincides¡

∃ mereologically-coincides Thing ⊆ endurant

⊤ ⊆ ∀ mereologically-coincides endurant

### **overlaps**

⊆ mediated-relation

¡http://www.loa-cnr.it/ontologies/DOLCE-Lite.owloverlaps¡ ≡ ¡http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlverla

∃ overlaps Thing ⊆ particular

$\top \sqsubseteq \forall$  overlaps particular

### **part**

$\sqsubseteq$  immediate-relation

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlpart-of}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlpart-}$

$\text{TransitivePropertypart}$

$\exists$  part Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  part particular

### **part-of**

$\sqsubseteq$  immediate-relation-i

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlpart-of}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlpart-}$

$\text{TransitivePropertypart-of}$

$\exists$  part-of Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  part-of particular

### **participant**

$\sqsubseteq$  immediate-relation

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlparticipant}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlpa}$   
 $\text{in}_i^-$

$\exists$  participant Thing  $\sqsubseteq$  perdurant

$\top \sqsubseteq \forall$  participant endurant

### **participant-in**

$\sqsubseteq$  immediate-relation-i

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlparticipant}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlpa}$   
 $\text{in}_i^-$

$\exists$  participant-in Thing  $\sqsubseteq$  endurant

$\top \sqsubseteq \forall$  participant-in perdurant

### **partly-compresent**

$\sqsubseteq$  mediated-relation

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlpartly-compresent}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite}$   
 $\text{compresent}_i^-$

$\exists$  partly-compresent Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  partly-compresent particular

### **physical-location**

$\sqsubseteq$  exact-location

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlphysical-location}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite}$   
 $\text{location-of}_i^-$

$\exists$  physical-location Thing  $\sqsubseteq$  physical-endurant  
 $\top \sqsubseteq \forall$  physical-location physical-region

### physical-location-of

$\sqsubseteq$  exact-location-of

$\{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlphysical-location} \} \equiv \{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite-location-of} \}^-$

$\exists$  physical-location-of Thing  $\sqsubseteq$  physical-region

$\top \sqsubseteq \forall$  physical-location-of physical-endurant

### proper-part

$\sqsubseteq$  part

$\{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlproper-part-of} \} \equiv \{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite-part} \}^-$

TransitivePropertyproper-part

$\exists$  proper-part Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  proper-part particular

### proper-part-of

$\sqsubseteq$  part-of

$\{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlproper-part-of} \} \equiv \{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite-part} \}^-$

TransitivePropertyproper-part-of

$\exists$  proper-part-of Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  proper-part-of particular

### q-location

$\sqsubseteq$  immediate-relation

$\{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlq-location-of} \} \equiv \{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite-owlq} \}^-$

$\exists$  q-location Thing  $\sqsubseteq$  quality

$\top \sqsubseteq \forall$  q-location region

### q-location-of

$\sqsubseteq$  immediate-relation-i

$\{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlq-location-of} \} \equiv \{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite-owlq} \}^-$

$\exists$  q-location-of Thing  $\sqsubseteq$  region

$\top \sqsubseteq \forall$  q-location-of quality

### q-present-at

$\sqsubseteq$  mediated-relation

$\{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltime-of-q-presence-of} \} \equiv \{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite-present-at} \}^-$

$\exists$  q-present-at Thing  $\sqsubseteq$  physical-quality  
 $\top \sqsubseteq \forall$  q-present-at time-interval

### quale-of

$\sqsubseteq$  q-location-of  
 $\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#} \text{quale}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#}$   
 $\text{of}_i^-$   
 $\exists$  quale-of Thing  $\sqsubseteq$  quale  
 $\top \sqsubseteq \forall$  quale-of quality

### r-location

$\sqsubseteq$  immediate-relation  
 $\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#} \text{r-location-of}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#}$   
 $\exists$  r-location Thing  $\sqsubseteq$  region  
 $\top \sqsubseteq \forall$  r-location region

### r-location-of

$\sqsubseteq$  immediate-relation-i  
 $\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#} \text{r-location-of}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#}$   
 $\exists$  r-location-of Thing  $\sqsubseteq$  region  
 $\top \sqsubseteq \forall$  r-location-of region

### sibling-part

$\sqsubseteq$  mediated-relation  
 $\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#} \text{sibling-part}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#}$   
 $\text{part}_i^-$   
 $\exists$  sibling-part Thing  $\sqsubseteq$  particular  
 $\top \sqsubseteq \forall$  sibling-part particular

### spatio-temporal-presence-of

$\sqsubseteq$  exact-location-of  
 $\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#} \text{spatio-temporally-present-at}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#}$   
 $\text{spatio-temporal-presence-of}_i^-$   
 $\exists$  spatio-temporal-presence-of Thing  $\sqsubseteq$  spatio-temporal-region  
 $\top \sqsubseteq \forall$  spatio-temporal-presence-of particular

### spatio-temporally-present-at

$\sqsubseteq$  exact-location  
 $\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#} \text{spatio-temporally-present-at}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#}$   
 $\text{spatio-temporal-presence-of}_i^-$   
 $\exists$  spatio-temporally-present-at Thing  $\sqsubseteq$  particular  
 $\top \sqsubseteq \forall$  spatio-temporally-present-at spatio-temporal-region

### **specific-constant-constituent**

⊆ immediate-relation

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#specific-constant-constituent}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#specific-constant-constituent-of}_i^-$

$\exists \text{specific-constant-constituent Thing} \sqsubseteq \text{particular}$

$\top \sqsubseteq \forall \text{specific-constant-constituent particular}$

### **specific-constant-constituent-of**

⊆ immediate-relation-i

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#specific-constant-constituent}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#specific-constant-constituent-of}_i^-$

$\exists \text{specific-constant-constituent-of Thing} \sqsubseteq \text{particular}$

$\top \sqsubseteq \forall \text{specific-constant-constituent-of particular}$

### **specific-constant-dependent**

⊆ immediate-relation

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#specific-constant-dependent}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#specifically-constantly-dependent-on}_i^-$

$\exists \text{specific-constant-dependent Thing} \sqsubseteq \text{particular}$

$\top \sqsubseteq \forall \text{specific-constant-dependent particular}$

### **specifically-constantly-dependent-on**

⊆ immediate-relation-i

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#specific-constant-dependent}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#specifically-constantly-dependent-on}_i^-$

$\exists \text{specifically-constantly-dependent-on Thing} \sqsubseteq \text{particular}$

$\top \sqsubseteq \forall \text{specifically-constantly-dependent-on particular}$

### **strong-connection**

⊆ mediated-relation

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#strong-connection}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#strong-connection}_i^-$

$\exists \text{strong-connection Thing} \sqsubseteq \text{particular}$

$\top \sqsubseteq \forall \text{strong-connection particular}$

### **t-inherent-in**

⊆ inherent-in

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#t-inherent-in}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl\#t-quality}_i^-$

$\exists \text{t-inherent-in Thing} \sqsubseteq \text{quality}$

$\top \sqsubseteq \forall \text{t-inherent-in particular}$

### **temporary-atomic-part**

$\sqsubseteq$  temporary-proper-part

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-atomic-part}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlatomic-part-of}_i^-$

$\exists$  temporary-atomic-part Thing  $\sqsubseteq$  endurant

$\top \sqsubseteq \forall$  temporary-atomic-part endurant

### **temporary-atomic-part-of**

$\sqsubseteq$  temporary-proper-part-of

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-atomic-part}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlatomic-part-of}_i^-$

$\exists$  temporary-atomic-part-of Thing  $\sqsubseteq$  endurant

$\top \sqsubseteq \forall$  temporary-atomic-part-of endurant

### **temporary-part**

$\sqsubseteq$  part

$\sqsubseteq$  partly-compresent

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-part-of}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlpart}_i^-$

$\exists$  temporary-part Thing  $\sqsubseteq$  endurant

$\top \sqsubseteq \forall$  temporary-part endurant

### **temporary-part-of**

$\sqsubseteq$  partly-compresent

$\sqsubseteq$  part-of

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-part-of}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlpart}_i^-$

$\exists$  temporary-part-of Thing  $\sqsubseteq$  endurant

$\top \sqsubseteq \forall$  temporary-part-of endurant

### **temporary-participant**

$\sqsubseteq$  participant

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-participant-in}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-participant}_i^-$

$\exists$  temporary-participant Thing  $\sqsubseteq$  perdurant

$\top \sqsubseteq \forall$  temporary-participant endurant

### **temporary-participant-in**

$\sqsubseteq$  participant-in

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-participant-in}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-participant}_i^-$

$\exists$  temporary-participant-in Thing  $\sqsubseteq$  endurant

$\top \sqsubseteq \forall$  temporary-participant-in perdurant

### **temporary-proper-part**

$\sqsubseteq$  temporary-part

$\sqsubseteq$  proper-part

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-proper-part-of}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-proper-part}_i^-$

$\exists$  temporary-proper-part Thing  $\sqsubseteq$  endurant

$\top \sqsubseteq \forall$  temporary-proper-part endurant

### **temporary-proper-part-of**

$\sqsubseteq$  temporary-part-of

$\sqsubseteq$  proper-part-of

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-proper-part-of}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-proper-part}_i^-$

$\exists$  temporary-proper-part-of Thing  $\sqsubseteq$  endurant

$\top \sqsubseteq \forall$  temporary-proper-part-of endurant

### **time-of-q-presence-of**

$\sqsubseteq$  mediated-relation-i

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltime-of-q-presence-of}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltime-of-q-presence-of}_i^-$

$\exists$  time-of-q-presence-of Thing  $\sqsubseteq$  time-interval

$\top \sqsubseteq \forall$  time-of-q-presence-of physical-quality

### **total-constant-participant**

$\sqsubseteq$  constant-participant

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltotal-constant-participant-in}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltotal-constant-participant}_i^-$

$\exists$  total-constant-participant Thing  $\sqsubseteq$  perdurant

$\top \sqsubseteq \forall$  total-constant-participant endurant

### **total-constant-participant-in**

$\sqsubseteq$  constant-participant-in

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltotal-constant-participant-in}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltotal-constant-participant-in}_i^-$

$\exists$  total-constant-participant-in Thing  $\sqsubseteq$  endurant

$\top \sqsubseteq \forall$  total-constant-participant-in perdurant

### **total-temporary-participant**

$\sqsubseteq$  temporary-participant

$\{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltotal-temporary-participant-in} \}_i \equiv \{ \text{http://www.loa-cnr.it/ontologies/Lite.owltotal-temporary-participant} \}_i^-$   
 $\exists \text{ total-temporary-participant Thing } \sqsubseteq \text{perdurant}$   
 $\top \sqsubseteq \forall \text{ total-temporary-participant } \text{endurant}$

### **total-temporary-participant-in**

$\sqsubseteq \text{temporary-participant-in}$   
 $\{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltotal-temporary-participant-in} \}_i \equiv \{ \text{http://www.loa-cnr.it/ontologies/Lite.owltotal-temporary-participant} \}_i^-$   
 $\exists \text{ total-temporary-participant-in Thing } \sqsubseteq \text{endurant}$   
 $\top \sqsubseteq \forall \text{ total-temporary-participant-in } \text{perdurant}$

### **weak-connection**

$\sqsubseteq \text{immediate-relation}$   
 $\{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlweak-connection} \}_i \equiv \{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.connection} \}_i^-$   
 $\exists \text{ weak-connection Thing } \sqsubseteq \text{particular}$   
 $\top \sqsubseteq \forall \text{ weak-connection } \text{particular}$

## **Data properties**

### **Individuals**

### **Datatypes**

**string**