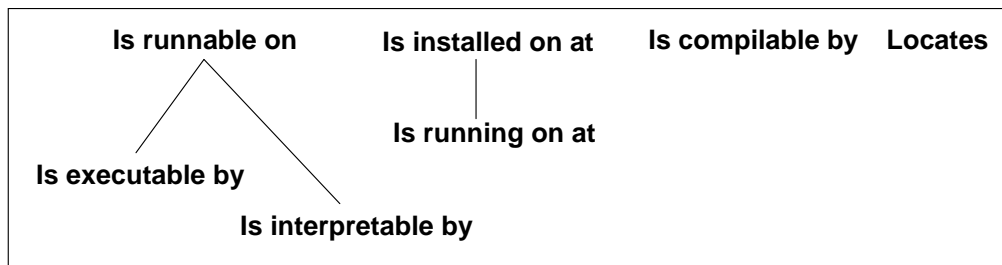


## Computer language expression - OS

// Metadata

Name	Computer language expression-OS
Keywords	Data description language expression, URI, URL, XML expression, WSDL description, Query expression, Command expression, Program, Source code, Executable program, Interpretable program, Lexeme
Creation date	September 30 <sup>th</sup> , 2008
Last modification date	March 30 <sup>th</sup> , 2009
Has contributor	Frédéric Fürst (v1.0 + v1.1), Gilles Kassel (v1.0 + v1.1), Pascal Lando (v1.0), Anne Lapujade (v1.0)
Revisions made in v1.1	Relations 'is installed on at' and 'is running on at' have been added. The concept 'WSDL description' has been added.
Used ontology engineering methodology	OntoSpec
Is of type	Core ontology
Natural language	English
Has ontology language	OntoSpec
Has formality level	Semi-informal
Ressource locator	<a href="http://www.laria.u-picardie.fr/IC/site/IMG/pdf/Computer_language_expression-OS.pdf">http://www.laria.u-picardie.fr/IC/site/IMG/pdf/Computer_language_expression-OS.pdf</a>
Version	1.1
Number of concepts (classes)	36
Number of relations (properties)	7

// Relations



Is compilable by

### Properties

[EP/DR & RR] A COMPILABLE PROGRAM *is compilable by* a COMPILER.

**Comment**

[DEF] A COMPILABLE PROGRAM *is compilable by* a COMPILER means that the COMPILABLE PROGRAM can play the role of data in a COMPILING A PROGRAM using a COMPILER as instrument.

Is installed on at

**Properties**

[EP/DR1 & R2 & R3] A PROGRAM or SOFTWARE *is installed on* a PLATFORM at a TIME INTERVAL.

**Comment**

[DEF] A PROGRAM (or SOFTWARE) *is installed on* a PLATFORM at a TIME INTERVAL means that a physical materialization of the PROGRAM (or SOFTWARE) has been added to the PLATFORM from an installation disc, from the internet, or from a network, and that it is present on that PLATFORM at the TIME INTERVAL. Note that it doesn't mean that the PROGRAM (or SOFTWARE) is currently running on the PLATFORM.

Is running on at, runs on at

**Properties**

[EP/DR1 & R2 & R3] A PROGRAM or SOFTWARE *is running on* a PLATFORM at a TIME INTERVAL. [EP/SL] *x is running on y at t* implies that *x is installed on y at t*. [EP/NSMC] *x is running on y at t* iff there exists a RUNNING A PROGRAM or RUNNING A SOFTWARE *z* such that *x is a data of z at t* and *z has for agent y at t*. [EP/IVL] *Is running on at* mutually implies *runs at*. [EP/NMC] *x is running on y at t* implies that *x is runnable on y*.

**Comment**

[DEF] A PROGRAM (or SOFTWARE) *is running on* a PLATFORM at a TIME INTERVAL means that the instructions of the PROGRAM or SOFTWARE main's program are carried out at that TIME INTERVAL.

Is runnable on

**Properties**

[EP/DR1 & R2 & R3] A PROGRAM or SOFTWARE *is runnable on* a PLATFORM.

**Comment**

[DEF] A PROGRAM (or SOFTWARE) *is runnable on* a PLATFORM means that the PROGRAM (or SOFTWARE) can play the role of data in an action RUNNING A PROGRAM (or SOFTWARE) using a PLATFORM as instrument.

Is executable by

**Properties**

[EP/DR1 & DR2 & R3] An EXECUTABLE PROGRAM or an INTERMEDIATE CODE *is executable by* an OPERATING SYSTEM or a VIRTUAL MACHINE. [EP/SL] *x is executable by y* implies that *x is runnable on y*.

Is interpretable by

**Properties**

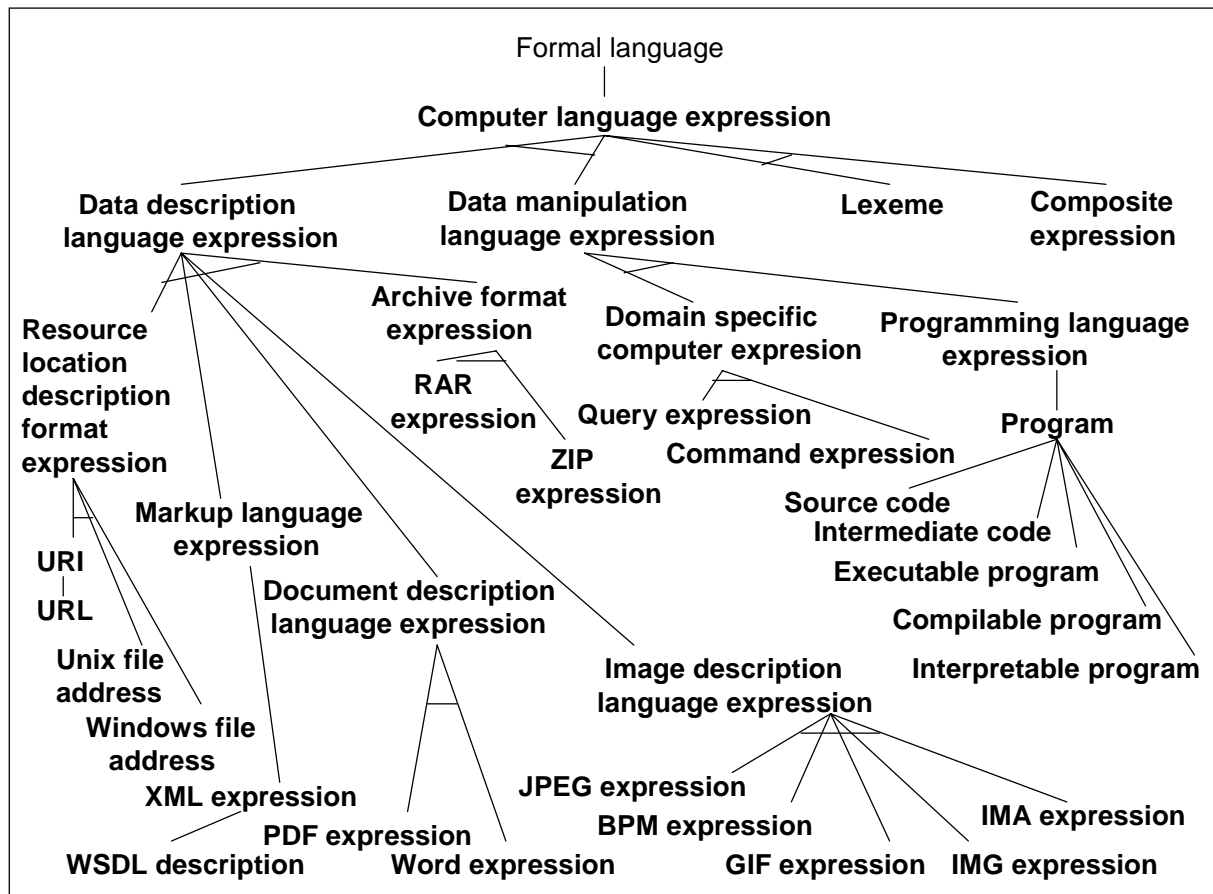
[EP/R1 & R2 & R3] An INTERPRETABLE PROGRAM *is interpretable by* an INTERPRETER. [EP/SL] *x is interpretable by y* implies that *x is runnable on y*.

Locates

### Properties

[EP/DR & RR] A RESOURCE LOCATION DESCRIPTION FORMAT EXPRESSION  
*locates* a FILE. [EP/IVL] *Locates* mutually implies *is located by*.

// Concepts



Computer language expression

### Meta-properties

COMPUTER LANGUAGE EXPRESSION is RIGID (+**R**). COMPUTER LANGUAGE EXPRESSION is EXTERNALLY-DEPENDENT (+**D**). DATA DESCRIPTION LANGUAGE EXPRESSION and DATA MANIPULATION LANGUAGE EXPRESSION is a non-trivial partition of COMPUTER LANGUAGE EXPRESSION. LEXEME and COMPOSITE EXPRESSION is a non-trivial partition of COMPUTER LANGUAGE EXPRESSION.

### Properties

[EP/SLD] A COMPUTER LANGUAGE EXPRESSION is a FORMAL EXPRESSION which is a well formed formula of a COMPUTER LANGUAGE.

Data description language expression

### Meta-properties

DATA DESCRIPTION LANGUAGE EXPRESSION is RIGID (+**R**). DATA DESCRIPTION LANGUAGE EXPRESSION is EXTERNALLY-DEPENDENT (+**D**). ARCHIVE FORMAT EXPRESSION, RESOURCE LOCATION DESCRIPTION FORMAT EXPRESSION, MARKUP LANGUAGE EXPRESSION, DOCUMENT DESCRIPTION LANGUAGE EXPRESSION, and IMAGE DESCRIPTION LANGUAGE EXPRESSION *is a disjunctive sub-division of* DATA DESCRIPTION LANGUAGE EXPRESSION.

**Properties**

[EP/SLD] A DATA DESCRIPTION LANGUAGE EXPRESSION is a COMPUTER LANGUAGE EXPRESSION which *is a well formed formula of* a DATA DESCRIPTION LANGUAGE.

Archive format expression

**Meta-properties**

ARCHIVE FORMAT EXPRESSION is RIGID (+**R**). ARCHIVE FORMAT EXPRESSION is EXTERNALLY-DEPENDENT (+**D**). RAR EXPRESSION and ZIP EXPRESSION *is a disjunctive sub-division of* ARCHIVE FORMAT EXPRESSION.

**Properties**

[EP/SLD] An ARCHIVE FORMAT EXPRESSION is a DATA DESCRIPTION LANGUAGE EXPRESSION which *is a well-formed formula of* an ARCHIVE FORMAT.

RAR expression

**Meta-properties**

RAR EXPRESSION is RIGID (+**R**). RAR EXPRESSION is EXTERNALLY-DEPENDENT (+**D**).

**Properties**

[EP/SLD] A RAR EXPRESSION is an ARCHIVE FORMAT EXPRESSION which *is a well-formed formula of* a RAR FORMAT.

ZIP expression

**Meta-properties**

ZIP EXPRESSION is RIGID (+**R**). ZIP EXPRESSION is EXTERNALLY-DEPENDENT (+**D**).

**Properties**

[EP/SLD] A ZIP EXPRESSION is an ARCHIVE FORMAT EXPRESSION which *is a well-formed formula of* a ZIP FORMAT.

Resource location description format expression

**Meta-properties**

RESOURCE LOCATION DESCRIPTION FORMAT EXPRESSION is RIGID (+**R**). RESOURCE LOCATION DESCRIPTION FORMAT EXPRESSION is EXTERNALLY-DEPENDENT (+**D**). URI, UNIX FILE ADDRESS, and WINDOWS FILE ADDRESS *is a disjunctive sub-division of* RESOURCE LOCATION DESCRIPTION FORMAT EXPRESSION.

**Properties**

[EP/SLD] A RESOURCE LOCATION DESCRIPTION FORMAT EXPRESSION is a DATA DESCRIPTION LANGUAGE EXPRESSION which *is a well formed formula of* a RESOURCE LOCATION DESCRIPTION FORMAT.

## URI

### Meta-properties

URI is RIGID (+**R**). URI is EXTERNALLY-DEPENDENT (+**D**).

### Properties

[EP/SLD] An URI is a RESOURCE LOCATION DESCRIPTION FORMAT EXPRESSION which *is a well formed formula of* a URI FORMAT.

## URL

### Meta-properties

URL is RIGID (+**R**). URL is EXTERNALLY-DEPENDENT (+**D**).

### Properties

[EP/SLD] An URL is an URI which *is a well formed formula of* a URL FORMAT.

## UNIX file address

### Meta-properties

UNIX FILE ADDRESS is RIGID (+**R**). UNIX FILE ADDRESS is EXTERNALLY-DEPENDENT (+**D**).

### Properties

[EP/SLD] A UNIX FILE ADDRESS is a RESOURCE LOCATION DESCRIPTION FORMAT EXPRESSION which *is a well formed formula of* a UNIX FILE ADDRESSING FORMAT.

## Windows file address

### Meta-properties

WINDOWS FILE ADDRESS is RIGID (+**R**). WINDOWS FILE ADDRESS is EXTERNALLY-DEPENDENT (+**D**).

### Properties

[EP/SLD] A WINDOWS FILE ADDRESS is a RESOURCE LOCATION DESCRIPTION FORMAT EXPRESSION which *is a well-formed formula of* a WINDOWS FILE ADDRESSING FORMAT.

## Markup language expression

### Meta-properties

MARKUP LANGUAGE EXPRESSION is RIGID (+**R**). MARKUP LANGUAGE EXPRESSION is EXTERNALLY-DEPENDENT (+**D**).

### Properties

[EP/SLD] A MARKUP LANGUAGE EXPRESSION is a DATA DESCRIPTION LANGUAGE EXPRESSION which *is a well-formed formula of* a MARKUP LANGUAGE.

## XML expression

### Meta-properties

XML EXPRESSION is RIGID (+**R**). XML EXPRESSION is EXTERNALLY-DEPENDENT (+**D**).

### Properties

[EP/SLD] An XML EXPRESSION is a MARKUP LANGUAGE EXPRESSION which *is a well-formed formula of* a XML FORMAT.

## WSDL description, WSDL expression

**Meta-properties**

WSDL DESCRIPTION is RIGID (+**R**). WSDL DESCRIPTION is EXTERNALLY-DEPENDENT (+**D**).

**Properties**

[EP/SLD] A WSDL DESCRIPTION, or WSDL EXPRESSION, is an XML EXPRESSION which *is a well-formed formula of* a WSDL LANGUAGE and which *expresses* a SERVICE INTERFACE *at* a TIME INTERVAL.

## Document description language expression

**Meta-properties**

DOCUMENT DESCRIPTION LANGUAGE EXPRESSION is RIGID (+**R**). DOCUMENT DESCRIPTION LANGUAGE EXPRESSION is EXTERNALLY-DEPENDENT (+**D**). PDF EXPRESSION and WORD EXPRESSION *is a disjunctive sub-division of* DOCUMENT DESCRIPTION LANGUAGE EXPRESSION.

**Properties**

[EP/SLD] A DOCUMENT DESCRIPTION LANGUAGE EXPRESSION is a DATA DESCRIPTION LANGUAGE EXPRESSION which *is a well-formed formula of* a DOCUMENT DESCRIPTION LANGUAGE.

## PDF expression

**Meta-properties**

PDF EXPRESSION is RIGID (+**R**). PDF EXPRESSION is EXTERNALLY-DEPENDENT (+**D**).

**Properties**

[EP/SLD] A PDF EXPRESSION is a DOCUMENT DESCRIPTION LANGUAGE EXPRESSION which *is a well-formed formula of* a PDF FORMAT.

## Word expression

**Meta-properties**

WORD EXPRESSION is RIGID (+**R**). WORD EXPRESSION is EXTERNALLY-DEPENDENT (+**D**).

**Properties**

[EP/SLD] A WORD EXPRESSION is a DOCUMENT DESCRIPTION LANGUAGE EXPRESSION which *is a well-formed formula of* a WORD FORMAT.

## Image description language expression

**Meta-properties**

IMAGE DESCRIPTION LANGUAGE EXPRESSION is RIGID (+**R**). IMAGE DESCRIPTION LANGUAGE EXPRESSION is EXTERNALLY-DEPENDENT (+**D**). JPEG EXPRESSION, BPM EXPRESSION, GIF EXPRESSION, IMG EXPRESSION, and IMA EXPRESSION is a disjunctive sub-division of IMAGE DESCRIPTION LANGUAGE EXPRESSION.

**Properties**

[EP/SLD] An IMAGE DESCRIPTION LANGUAGE EXPRESSION is a DATA DESCRIPTION LANGUAGE EXPRESSION which *is a well-formed formula of* an IMAGE DESCRIPTION LANGUAGE.

## JPEG expression

**Meta-properties**

JPEG EXPRESSION is RIGID (+**R**). JPEG EXPRESSION is EXTERNALLY-DEPENDENT (+**D**).

**Properties**

[EP/SLD] A JPEG EXPRESSION is an IMAGE DESCRIPTION LANGUAGE EXPRESSION which *is a well-formed formula of* a JPEG FORMAT.

BMP expression

**Meta-properties**

BMP EXPRESSION is RIGID (+**R**). BMP EXPRESSION is EXTERNALLY-DEPENDENT (+**D**).

**Properties**

[EP/SLD] A BMP EXPRESSION is a IMAGE DESCRIPTION LANGUAGE EXPRESSION which *is a well-formed formula of* a BMP FORMAT.

GIF expression

**Meta-properties**

GIF EXPRESSION is RIGID (+**R**). GIF EXPRESSION is EXTERNALLY-DEPENDENT (+**D**).

**Properties**

[EP/SLD] A GIF EXPRESSION is a IMAGE DESCRIPTION LANGUAGE EXPRESSION which *is a well-formed formula of* a GIF FORMAT.

**Comment**

IMG expression

**Meta-properties**

IMG EXPRESSION is RIGID (+**R**). IMG EXPRESSION is EXTERNALLY-DEPENDENT (+**D**).

**Properties**

[EP/SLD] An IMG EXPRESSION is an IMAGE DESCRIPTION LANGUAGE EXPRESSION which *is a well-formed formula of* an IMG FORMAT.

IMA expression

**Meta-properties**

IMA EXPRESSION is RIGID (+**R**). IMA EXPRESSION is EXTERNALLY-DEPENDENT (+**D**).

**Properties**

[EP/SLD] An IMA EXPRESSION is an IMAGE DESCRIPTION LANGUAGE EXPRESSION which *is a well-formed formula of* an IMA FORMAT.

Data manipulation language expression

**Meta-properties**

DATA MANIPULATION LANGUAGE EXPRESSION is RIGID (+**R**). DATA MANIPULATION LANGUAGE EXPRESSION is EXTERNALLY-DEPENDENT (+**D**). DOMAIN SPECIFIC COMPUTER EXPRESSION and PROGRAMMING LANGUAGE EXPRESSION *is a disjunctive sub-division of* DATA MANIPULATION LANGUAGE EXPRESSION.

**Properties**

[EP/SLD] A DATA MANIPULATION LANGUAGE EXPRESSION is a COMPUTER LANGUAGE EXPRESSION which *is a well-formed formula of a DATA MANIPULATION LANGUAGE*.

Domain specific computer language expression

**Meta-properties**

DOMAIN SPECIFIC COMPUTER LANGUAGE EXPRESSION is RIGID (+**R**). DOMAIN SPECIFIC COMPUTER LANGUAGE EXPRESSION is EXTERNALLY-DEPENDENT (+**D**). QUERY EXPRESSION and COMMAND EXPRESSION *is a disjunctive sub-division of* DOMAIN SPECIFIC COMPUTER LANGUAGE EXPRESSION.

**Properties**

[EP/SLD] A DOMAIN SPECIFIC COMPUTER LANGUAGE EXPRESSION is a DATA MANIPULATION LANGUAGE EXPRESSION which *is a well-formed formula of a DOMAIN SPECIFIC COMPUTER LANGUAGE*.

Query expression

**Meta-properties**

QUERY EXPRESSION is RIGID (+**R**). QUERY EXPRESSION is EXTERNALLY-DEPENDENT (+**D**).

**Properties**

[EP/SLD] A QUERY EXPRESSION is a DOMAIN SPECIFIC COMPUTER LANGUAGE EXPRESSION which *is a well-formed formula of a QUERY LANGUAGE*.

**Comment**

[EX] Examples of QUERY EXPRESSIONS are “create table table1 (id Integer, col2 Integer, col3 Date)” or “select \* from table1 where id=3”.

Command expression, Shell expression

**Meta-properties**

COMMAND EXPRESSION is RIGID (+**R**). COMMAND EXPRESSION is EXTERNALLY-DEPENDENT (+**D**).

**Properties**

[EP/SLD] A COMMAND EXPRESSION is a DOMAIN SPECIFIC COMPUTER LANGUAGE EXPRESSION which *is a well-formed formula of a COMMAND LANGUAGE*.

**Comment**

[EX] Examples of COMMAND EXPRESSIONS are “cd /etc;find . -name “r\*”” or “chmod 755 dossier”.

Programming language expression

**Meta-properties**

PROGRAMMING LANGUAGE EXPRESSION is RIGID (+**R**). PROGRAMMING LANGUAGE EXPRESSION is EXTERNALLY-DEPENDENT (+**D**).

**Properties**

[EP/SLD] A PROGRAMMING LANGUAGE EXPRESSION LANGUAGE EXPRESSION is a DATA MANIPULATION LANGUAGE EXPRESSION which *is a well formed formula of a PROGRAMMING LANGUAGE*.

**Comment**

[EX] Examples of PROGRAMMING LANGUAGE EXPRESSIONS are “private int al;”

or “if ( $n > 2$ ) return  $n * \text{factorielle}(n - 1)$ ;”.

## Program

### Meta-properties

PROGRAM is RIGID (+**R**). PROGRAM is EXTERNALLY-DEPENDENT (+**D**).

### Properties

[EP/SLD] A PROGRAM is a PROGRAMMING LANGUAGE EXPRESSION which *is runnable on* at least one PLATFORM. Every PROGRAM is an ARTIFACT OF COMPUTATIONAL ACTION.

### Comment

[CIT] (Lando *et al.* 2008) “a program is a Data Manipulation Language Expression ordered by a Turing-complete language which can be run on a computer”.

## Source code, Human readable code

### Meta-properties

SOURCE CODE is RIGID (+**R**). SOURCE CODE is EXTERNALLY-DEPENDENT (+**D**).

### Properties

[EP/SL] A SOURCE CODE, or HUMAN READABLE CODE, is a PROGRAM which *is a well formed formula of* a HIGH-LEVEL COMPUTER LANGUAGE.

### Comment

[DEF] Article “Source code” of Wikipedia: source code (commonly just source or code) is any sequence of statements and/or declarations written in some human-readable computer programming language.

## Compilable program

### Meta-properties

COMPILABLE PROGRAM is RIGID (+**R**). COMPILABLE PROGRAM is EXTERNALLY-DEPENDENT (+**D**).

### Properties

[EP/SLD] A COMPILABLE PROGRAM is a PROGRAM which *is compilable by* at least one COMPILER.

### Comment

[EX] Examples of COMPILABLE PROGRAMS are PROGRAMS written in C language or ADA.

## Interpretable program

### Meta-properties

INTERPRETABLE PROGRAM is RIGID (+**R**). INTERPRETABLE PROGRAM is EXTERNALLY-DEPENDENT (+**D**).

### Properties

[EP/SLD] An INTERPRETABLE PROGRAM is a PROGRAM which *is interpretable by* at least one INTERPRETER.

### Comment

[EX] Examples of INTERPRETABLE PROGRAMS are PROGRAMS written in Prolog, or in Python.

## Intermediate code

### Meta-properties

INTERMEDIATE CODE is RIGID (+**R**). INTERMEDIATE CODE is EXTERNALLY-DEPENDENT (+**D**).

**Properties**

[EP/SLD] An INTERMEDIATE CODE is a PROGRAM which *is a well formed formula of* an INTERMEDIATE CODE LANGUAGE. [EP/ER] Every INTERMEDIATE CODE *is executable by* at least one VIRTUAL MACHINE.

**Comment**

[EX] Examples of INTERMEDIATE CODES are PROGRAMS generated by compiling Java SOURCE CODE.

Executable program

**Meta-properties**

EXECUTABLE PROGRAM is RIGID (+**R**). EXECUTABLE PROGRAM is EXTERNALLY-DEPENDENT (+**D**).

**Properties**

[EP/SLD] An EXECUTABLE PROGRAM is a PROGRAM which *is executable by* at least one OPERATING SYSTEM.

**Comment**

[CIT] Article “Executable Program” of Wikipedia: An executable or executable file, in computer science, is a file whose contents are meant to be interpreted as a program by a computer.

Lexeme

**Meta-properties**

LEXEME is RIGID (+**R**). LEXEME is EXTERNALLY-DEPENDENT (+**D**).

**Properties**

[EP/SLD] A LEXEME is a COMPUTER LANGUAGE EXPRESSION which is an ATOM.

**Comment**

[EX] Examples of LEXEMES are “class” “MyClass” or “3.14”.

Composite expression

**Meta-properties**

COMPOSITE EXPRESSION is RIGID (+**R**). COMPOSITE EXPRESSION is EXTERNALLY-DEPENDENT (+**D**).

**Properties**

[EP/SLD] A COMPOSITE EXPRESSION is a COMPUTER LANGUAGE EXPRESSION which *has for proper part* at least one COMPUTER LANGUAGE EXPRESSION *at a* TIME INTERVAL.

**Comment**

[EX] Examples of COMPOSITE EXPRESSIONS are “int x = 3” or “for(int i = 0;i<3;i++) System.out.println(“hello”);”.