The Lemon Design Patterns Language

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This document was automatically generated by the *BNF-Converter*. It was generated together with the lexer, the parser, and the abstract syntax module, which guarantees that the document matches with the implementation of the language.

The lexical structure of parser

Identifiers

Identifiers $\langle Ident \rangle$ are unquoted strings beginning with a letter, followed by any combination of letters, digits, and the characters `_ '`, reserved words excluded.

Literals

String literals $\langle String \rangle$ have the form `"`x`"`, where x is any sequence of any characters except `"` unless preceded by `\`.

Double-precision float literals $\langle Double \rangle$ have the structure indicated by the regular expression $\langle digit \rangle + \text{‘.’} \langle digit \rangle + (\text{‘e’}\text{‘-’}? \langle digit \rangle +)?$ i.e. two sequences of digits separated by a decimal point, optionally followed by an unsigned or negative exponent.

FullURI literals are recognized by the regular expression $[\text{“<”}][\text{“ˆ>”}]*[\text{“>”}]$

Reserved words and symbols

The set of reserved words is the set of terminals appearing in the grammar. Those reserved words that consist of non-letter characters are called symbols, and they are treated in a different way from those that are similar to identifiers. The lexer follows rules familiar from languages like Haskell, C, and Java, including longest match and spacing conventions.

The reserved words used in parser are the following:

ClassNoun	ClassRelationalNoun
ConsequenceVerb	CopulativeArg
CopulativeSubject	DirectObject
EventVerb	IndirectObject
IntersectiveAdjective	IntersectiveDataPropertyAdjective
IntersectiveObjectPropertyAdjective	Lexicon
Name	PossessiveAdjunct
PostpositionalObject	PrepositionalObject
PropertyModifyingAdjective	RelationalAdjective
RelationalMultivalentNoun	RelationalNoun
ScalarAdjective	StateVerb
Subject	accusative
adjective	adposition
adverb	
article	as
bullet	central
circumposition	class
colon	comma
comparative	conditional
conjunction	contravariant
copula	covariant
dative	determiner
dual	durative
firstPerson	for
future	genitive
gerundive	imperative
imperfect	indicative
infinitive	instant
interjection	nominative
nontelic	noun
numeral	optional
participle	particle
past	plural
point	postposition
preposition	present
otherGender	pronoun
propObj	propSubj
property	punctuation
relationalArg	restrictedTo
secondPerson	semiColon
singular	slash
subjunctive	superlative
telic	thirdPerson
verb	with

`masculine`	`feminine`
`neuter`	`commonGender`
`dialectRegister`	`facetiousRegister`
`formalRegister`	`inHouseRegister`
`ironicRegister`	`neutralRegister`
`slangRegister`	`tabooRegister`
`technicalRegister`	`vulgarRegister`

The symbols used in parser are the following:

```
@prefix  :   .
(        ,   )
=        [   ]
/        >   <
=>
```

Comments

Single-line comments begin with `//`.
Multiple-line comments are enclosed with `/*` and `*/`.

The syntactic structure of parser

Non-terminals are enclosed between ⟨ and ⟩. The symbols ::= (production), | (union) and ϵ (empty rule) belong to the BNF notation. All other symbols are terminals.

⟨*Statements*⟩ ::= ⟨*ListStatement*⟩

⟨*Statement*⟩ ::= `@prefix` ⟨*Ident*⟩ `:` ⟨*FullURI*⟩ `.`
| `Lexicon` `(` ⟨*URI*⟩ `,` ⟨*String*⟩ `,` ⟨*ListPatternType*⟩ `)`

⟨*ListStatement*⟩ ::= ϵ
| ⟨*Statement*⟩ ⟨*ListStatement*⟩

⟨*PatternType*⟩ ::= ⟨*Pattern*⟩ ⟨*Register*⟩
| ⟨*Pattern*⟩

⟨*Pattern*⟩ ::= ⟨*Pattern*⟩ `with` ⟨*ListCategory*⟩ ⟨*String*⟩
| ⟨*NounPattern*⟩
| ⟨*NounPattern*⟩ ⟨*Gender*⟩
| ⟨*VerbPattern*⟩
| ⟨*AdjectivePattern*⟩

```
⟨NounPattern⟩   ::=  Name ( ⟨PNP⟩ , ⟨URI⟩ )
                 |   ClassNoun ( ⟨NP⟩ , ⟨URI⟩ )
                 |   ObjectPropertyNoun ( ⟨NP⟩ , ⟨URI⟩ , ⟨URI⟩ )
                 |   DataPropertyNoun ( ⟨NP⟩ , ⟨URI⟩ , ⟨URI⟩ )
                 |   RelationalNoun ( ⟨NP⟩ , ⟨URI⟩ ,
                     propSubj = ⟨Arg⟩ ,
                     propObj = ⟨Arg⟩ )
                 |   RelationalNoun ( ⟨NP⟩ , ⟨URI⟩ , propObj = ⟨Arg⟩ )
                 |   RelationalMultivalentNoun ( ⟨NP⟩ , ⟨URI⟩ , [
                     ⟨ListOntologyFrameElement⟩ ] )
                 |   ClassRelationalNoun ( ⟨NP⟩ , class = ⟨URI⟩ ,
                     property = ⟨URI⟩ , propSubj = ⟨Arg⟩ , propObj = ⟨Arg⟩ )
                 |   ClassRelationalNoun ( ⟨NP⟩ , class = ⟨URI⟩ ,
                     property = ⟨URI⟩ , propObj = ⟨Arg⟩ )

⟨VerbPattern⟩   ::=  StateVerb ( ⟨VP⟩ , ⟨URI⟩ )
                 |   StateVerb ( ⟨VP⟩ , ⟨URI⟩ , propObj = ⟨Arg⟩ )
                 |   StateVerb ( ⟨VP⟩ , ⟨URI⟩ , propSubj = ⟨Arg⟩ , propObj = ⟨Arg⟩ )
                 |   telic ⟨VerbPattern2⟩
                 |   nontelic ⟨VerbPattern2⟩
                 |   ⟨VerbPattern3⟩
                 |   ConsequenceVerb ( ⟨VP⟩ , ⟨URI⟩ ,
                     propSubj = ⟨OntologyFrameElement⟩ ,
                     propObj = ⟨OntologyFrameElement⟩ , ⟨URI⟩ )
                 |   ConsequenceVerb ( ⟨VP⟩ , ⟨URI⟩ ,
                     propSubj = ⟨OntologyFrameElement⟩ ,
                     propObj = ⟨OntologyFrameElement⟩ )
                 |   ConsequenceVerb ( ⟨VP⟩ , ⟨URI⟩ ,
                     propSubj = ⟨OntologyFrameElement⟩ ,
                     ⟨URI⟩ )
                 |   ConsequenceVerb ( ⟨VP⟩ , ⟨URI⟩ ,
                     propSubj = ⟨OntologyFrameElement⟩ )
                 |   ConsequenceVerb ( ⟨VP⟩ , ⟨URI⟩ ,
                     propObj = ⟨OntologyFrameElement⟩ ,
                     ⟨URI⟩ )
                 |   ConsequenceVerb ( ⟨VP⟩ , ⟨URI⟩ ,
                     propObj = ⟨OntologyFrameElement⟩ )
                 |   ConsequenceVerb ( ⟨VP⟩ , ⟨URI⟩
                     , ⟨URI⟩ )
                 |   ConsequenceVerb ( ⟨VP⟩ , ⟨URI⟩
                     )

⟨VerbPattern2⟩  ::=  durative ⟨VerbPattern3⟩
                 |   instant ⟨VerbPattern3⟩
```

```
⟨VerbPattern3⟩ ::= EventVerb ( ⟨VP⟩ , ⟨URI⟩ , [ ⟨ListOntologyFrameElement⟩ ] )

⟨AdjectivePattern⟩ ::= IntersectiveAdjective ( ⟨AP⟩ , ⟨URI⟩ )
                    |  IntersectiveObjectPropertyAdjective ( ⟨AP⟩ , ⟨URI⟩ , ⟨URI⟩ )
                    |  IntersectiveDataPropertyAdjective ( ⟨AP⟩ , ⟨URI⟩ , ⟨String⟩ )
                    |  PropertyModifyingAdjective ( ⟨AP⟩ , ⟨URI⟩ )
                    |  RelationalAdjective ( ⟨AP⟩ , ⟨URI⟩ , relationalArg = ⟨Arg⟩ )
                    |  ScalarAdjective ( ⟨AP⟩ , [ ⟨ListScalarMembership⟩ ] )

⟨ListPatternType⟩ ::= ϵ
                   |  ⟨PatternType⟩
                   |  ⟨PatternType⟩ , ⟨ListPatternType⟩

⟨Arg⟩ ::= ⟨Arg⟩ optional
       |  ⟨Arg⟩ restrictedTo ⟨URI⟩
       |  Subject
       |  DirectObject
       |  IndirectObject
       |  CopulativeArg
       |  CopulativeSubject
       |  PrepositionalObject ( ⟨String⟩ )
       |  PostpositionalObject ( ⟨String⟩ )
       |  PossessiveAdjunct

⟨OntologyFrameElement⟩ ::= ⟨URI⟩ as ⟨Arg⟩
                        |  ⟨Arg⟩

⟨ListOntologyFrameElement⟩ ::= ϵ
                            |  ⟨OntologyFrameElement⟩
                            |  ⟨OntologyFrameElement⟩ , ⟨ListOntologyFrameElement⟩

⟨PNP⟩ ::= ⟨String⟩
       |  [ ⟨ListPOSTaggedWord⟩ ]

⟨NP⟩ ::= ⟨String⟩
      |  [ ⟨ListPOSTaggedWord⟩ ]

⟨VP⟩ ::= ⟨String⟩
      |  [ ⟨ListPOSTaggedWord⟩ ]

⟨AP⟩ ::= ⟨String⟩
      |  [ ⟨ListPOSTaggedWord⟩ ]

⟨POSTaggedWord⟩ ::= ⟨String⟩ / ⟨POSTag⟩ = head
                 |  ⟨String⟩ / ⟨POSTag⟩
                 |  ⟨String⟩ / ⟨String⟩ / ⟨POSTag⟩ = head
                 |  ⟨String⟩ / ⟨String⟩ / ⟨POSTag⟩
```

```
⟨ListPOSTaggedWord⟩  ::=  ϵ
                       |  ⟨POSTaggedWord⟩ ⟨ListPOSTaggedWord⟩

⟨ScalarMembership⟩  ::=  ⟨URI⟩ covariant
                      |  ⟨URI⟩ contravariant
                      |  ⟨URI⟩ central
                      |  ⟨URI⟩ > ⟨Double⟩ for ⟨URI⟩
                      |  ⟨URI⟩ < ⟨Double⟩ for ⟨URI⟩
                      |  ⟨Double⟩ < ⟨URI⟩ < ⟨Double⟩ for ⟨URI⟩

⟨ListScalarMembership⟩  ::=  ϵ
                          |  ⟨ScalarMembership⟩
                          |  ⟨ScalarMembership⟩ , ⟨ListScalarMembership⟩

⟨Category⟩  ::=  singular
              |  dual
              |  plural
              |  nominative
              |  accusative
              |  genitive
              |  dative
              |  comparative
              |  superlative
              |  present
              |  past
              |  future
              |  firstPerson
              |  secondPerson
              |  thirdPerson
              |  imperfect
              |  imperative
              |  indicative
              |  subjunctive
              |  conditional
              |  gerundive
              |  infinitive
              |  participle
              |  ⟨URI⟩ => ⟨URI⟩

⟨ListCategory⟩  ::=  ϵ
                  |  ⟨Category⟩ ⟨ListCategory⟩
```

```
⟨POSTag⟩   ::=  adjective
             |  adposition
             |  adverb
             |  article
             |  bullet
             |  circumposition
             |  colon
             |  comma
             |  conjunction
             |  copula
             |  determiner
             |  interjection
             |  noun
             |  numeral
             |  particle
             |  point
             |  postposition
             |  preposition
             |  pronoun
             |  punctuation
             |  semiColon
             |  slash
             |  verb
             |  ⟨String⟩

⟨Gender⟩   ::=  masculine
             |  feminine
             |  neuter
             |  commonGender
             |  otherGender

⟨Register⟩ ::=  benchLevelRegister
             |  dialectRegister
             |  facetiousRegister
             |  formalRegister
             |  inHouseRegister
             |  ironicRegister
             |  neutralRegister
             |  slangRegister
             |  tabooRegister
             |  technicalRegister
             |  vulgarRegister
```

$$\begin{array}{lll}
\langle \mathit{URI} \rangle & ::= & \langle \mathit{Ident} \rangle \ \mathtt{:} \ \langle \mathit{Ident} \rangle \\
 & | & \mathtt{:} \ \langle \mathit{Ident} \rangle \\
 & | & \langle \mathit{FullURI} \rangle
\end{array}$$