

# jInfer Base Module Description

Michal Klempa, Mário Mikula, Robert Smetana, Michal Švirec, Matej Vitásek  
Advisors: RNDr. Irena Mlýnková, Ph.D., Martin Nečaský, Ph.D.

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Target audience: developers willing to extend jInfer.

Responsible developer	Matej Vitásek
Required tokens	none
Provided tokens	none
Module dependencies	none
Public packages	<code>cz.cuni.mff.ksi.jinfer.base.automaton</code> <code>cz.cuni.mff.ksi.jinfer.base.interfaces</code> <code>cz.cuni.mff.ksi.jinfer.base.interfaces.inference</code> <code>cz.cuni.mff.ksi.jinfer.base.interfaces.nodes</code> <code>cz.cuni.mff.ksi.jinfer.base.objects</code> <code>cz.cuni.mff.ksi.jinfer.base.objects.nodes</code> <code>cz.cuni.mff.ksi.jinfer.base.regex</code> <code>cz.cuni.mff.ksi.jinfer.base.utils</code> <code>org.apache.log4j.*</code>

## 1 Introduction

This is the module containing data structures, interfaces and logic shared across the whole jInfer framework. Virtually every other module containing logic should in theory depend on *Base*.

## 2 Structure

Description of *Base* structure will partially mirror its JavaDoc documentation ([KMS<sup>+</sup>g]). For more detailed information, refer to it directly.

*Base* contains logic for Log4j ([log]) initialization in *Installer* class. Configuration of the overall logging granularity level (NetBeans options integration) is contained in `cz.cuni.mff.ksi.jinfer.base.options` package. Shared jInfer graphics is contained in the `cz.cuni.mff.ksi.jinfer.base.graphics` and `cz.cuni.mff.ksi.jinfer.base.graphics.icons` packages.

### 2.1 Data structures

Regular expression representation is contained in `cz.cuni.mff.ksi.jinfer.base.regex` package. Most important class is of course *Regex*, assisted by an enum of its type *RegexType* and representation of its interval *RegexInterval*.

XML node representation is described by interfaces in `cz.cuni.mff.ksi.jinfer.base.interfaces.nodes` package and more-less concrete implementations in `cz.cuni.mff.ksi.jinfer.base.objects.nodes` package.

Finite state automata representation is contained in the `cz.cuni.mff.ksi.jinfer.base.automaton` package. Refer to [KMS<sup>+</sup>a] to get an accurate description of all these representations.

Miscellaneous shared classes are contained in `cz.cuni.mff.ksi.jinfer.base.objects`. For example, *Input* is used to provide the *Initial Grammar Generator* with input data. *Pair* is a generic class binding two object together in a *pair*.

## 2.2 Interfaces

Apart from interfaces contained in already discussed `cz.cuni.mff.ksi.jinfer.base.interfaces.nodes` package, there is an important group of interfaces contained in `cz.cuni.mff.ksi.jinfer.base.interfaces.inference` package: the *inference* interfaces. They come in two flavours: the actual inference interface, and its callback. For a comprehensive description of them and their interaction refer again to [KMS<sup>+</sup>a].

There is one more package containing interfaces: `cz.cuni.mff.ksi.jinfer.base.interfaces`. There are a few groups of them.

- Module lookup support: `NamedModule` and `UserModuleDescription`.
- Inference support: `Capabilities`.
- Service provider definitions: `Expander`, `Processor` and `RuleDisplayer`.

## 2.3 Utility logic

Useful logic for the whole framework is focused in the `cz.cuni.mff.ksi.jinfer.base.utils` package. A few highlights from here follow.

- Testing whether a collection is empty: `BaseUtils.isEmpty()` - handles null and zero elements.
- Filtering a list based on a predicate: `BaseUtils.filter()`.
- Cloning a list N times in a row: `baseUtils.cloneList()` - e.g. from *abc*, 3 times creates *abcabcabc*.
- Deep cloning a grammar: `CloneHelper.cloneGrammar()`.
- Writing out a list separated by specified separator: `CollectionToString.colToString()` - accepts the list, operation to perform on each element and separator character. Separator is placed smartly, i.e. only between elements.
- XML element comparison while ignoring specified members: `EqualityUtils`.
- Module lookup/selection: `ModuleSelectionHelper`.
- Singleton class reporting on the currently running inference: `RunningProject`.
- Various utilities for JUnit tests: `TestUtils`.
- Topological sorting of grammar: `TopologicalSort`.

## 3 Data flow

This is not an inference module and there is no real data flow in it. Refer to [KMS<sup>+</sup>a] to understand the inference process described by interfaces from `cz.cuni.mff.ksi.jinfer.base.interfaces.inference` package.

## 4 Extensibility

From one point of view, extensibility of *Base* means creating service providers implementing inference or other interfaces. This is described in the documentation for respective modules that use these interfaces.

On the other hand, if there is a need to share data structures, interfaces or logic across multiple developed modules (for example between custom schema generator and simplifier), it is advised to create a module similar to *Base* instead of changing it directly.

## References

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