

# The codedescribe and codelisting Packages

Version 1.1

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## Abstract

This documentation package is designed to be ‘as class independent as possible’, depending only on *expl3*, *scontents*, *listing* and *pifont*. Unlike other packages of the kind, a minimal set of macros/commands/environments is defined: most/all defined commands have an ‘object type’ as a *keyval* parameter, allowing for an easy expansion mechanism (instead of the usual ‘one set of macros/environments’ for each object type).

No assumption about page layout is made (besides ‘having a marginpar’), or underlying macros, so that it can be used with any document class.

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## 1 Introduction

This package aims to document both *Document* level (i.e. final user) commands, as well *Package/Class* level commands. It’s fully implemented using *expl3* syntax and structures, in special *l3coffins*, *l3seq* and *l3keys*. Besides those *scontents* and *listing* packages are used to typeset code snippets. The package *pifont* is needed just to typeset those (open)stars, in case one wants to mark a command as (restricted) expandable.

No other package/class is needed, any class can be used as the base one, which allows to demonstrate the documented commands with any desired layout.

*codelisting* defines a few macros to display and demonstrate L<sup>A</sup>T<sub>E</sub>X code (using *listings* and *scontents*), whilst *codedescribe* defines a series of macros to display/enumerate macros and environments (somewhat resembling the *doc3* style).

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\*<https://github.com/alceu-frigeri/codedescribe>

## 1.1 Single versus Multi-column Classes

This package 'can' be used with multi-column classes, given that the `\linewidth` and `\columnsep` are defined appropriately. `\linewidth` shall default to text/column real width, whilst `\columnsep`, if needed (2 or more columns) shall be greater than `\marginparwidth` plus `\marginparsep`.

## 1.2 Current Version

This doc regards to `codedescribe` version 1.1 and `codelisting` version 1.1. Those two packages are fairly stable, and given the `<obj-type>` mechanism (see below, 3.2) it can be easily extended without changing its interface.

# 2 codelisting Package

It requires two packages: `listings` and `scontents`, defines an environment: `codestore` and 2 main commands: `\tscode` and `\tsdemo` and 1 auxiliary command: `\setcodekeys`.

## 2.1 In Memory Code Storage

Thanks to `scontents` (`expl3` based) it's possible to store L<sup>A</sup>T<sub>E</sub>X code snippets in a `expl3` key.

```
codestore \begin{codestore} [<stcontents-keys>]  
          \end{codestore}
```

This environment is an alias to `scontents` environment (from `scontents` package), all `scontents` keys are valid, with two additional ones: `st` and `store-at` which are aliases to the `store-env` key. If an 'isolated' `<st-name>` is given (unknown `key`), it is assumed 'by Default' that the environment body shall be stored in it (for use with `\tscode` and `\tsdemo`).

## 2.2 Code Display/Demo

---

```
\setcodekeys \setcodekeys {<code-keys>}
```

One has the option to set `<code-keys>` (see 2.2.1) per `\tscode`/`\tsdemo` call, or *globally*, better said, *in the called context group*.

**N.B.:** All `\tscode` and `\tsdemo` commands create a local group in which the `<code-keys>` are defined, and discarded once said local group is closed. `\setcodekeys` defines those keys in the *current* context/group.

---

```
\tscode* \tscode* [<code-keys>] {<st-name>}  
\tsdemo* \tsdemo* [<code-keys>] {<st-name>}
```

`\tscode` just typesets `<st-name>` (the key-name created with `stcode`), in verbatim mode with syntax highlight. The non-star version centers it and use just half of the base line. The star version uses the full text width.

`\tsdemo*` first typesets `<st-name>`, as above, then it *executes* said code. The non-start versions place them side-by-side, whilst the star versions places one following the other.

For Example:

LaTeX Code:

```
\begin{codestore}[stmeta]
  Some \LaTeX~coding, for example: \ldots.
\end{codestore}
This will just typesets \tsobj[key]{stmeta}:
\tscode*[codeprefix={Sample Code:}] {stmeta}
and this will demonstrate it, side by side with source code:
\tsdemo[numbers=left,ruleht=0.5,
  codeprefix={inner sample code},
  resultprefix={inner sample result}] {stmeta}
```

LaTeX Result:

---

This will just typesets *stmeta*:

Sample Code:

Some \LaTeX~coding, for example: \ldots.

and this will demonstrate it, side by side with source code:

inner sample code

inner sample result

---

1	Some \LaTeX~coding, for example: \ldots.	Some LaTeX coding, for example: ....
---	--	--------------------------------------

---

### 2.2.1 Code Keys

Using a *key=value* syntax, one can fine tune *listings* syntax highlight.

<u>settexcs</u>	<i>settexcs</i> , <i>settexcs2</i> and <i>settexcs3</i>
<u>texcs</u>	<i>texcs</i> , <i>texcs2</i> and <i>texcs3</i>
<u>texcsstyle</u>	<i>texcsstyle</i> , <i>texcs2style</i> and <i>texcs3style</i>

Those define sets of LaTeX commands (csnames), the *set* variants initialize/redefine those sets (an empty list, clears the set), while the others extend those sets. The *style* ones redefines the command display style (an empty *<value>* resets the style to it's default).

<u>setkeywd</u>	<i>setkeywd</i> , <i>setkeywd2</i> and <i>setkeywd3</i>
<u>keywd</u>	<i>keywd</i> , <i>keywd2</i> and <i>keywd3</i>
<u>keywdstyle</u>	<i>keywdstyle</i> , <i>keywd2style</i> and <i>keywd3style</i>

Same for other *keywords* sets.

<u>setemph</u>	<i>setemph</i> , <i>setemph2</i> and <i>setemph3</i>
<u>emph</u>	<i>emph</i> , <i>emph2</i> and <i>emph3</i>
<u>emphstyle</u>	<i>emphstyle</i> , <i>emph2style</i> and <i>emph3style</i>

for some extra emphasis sets.

<u>numbers</u>	<i>numbers</i> and <i>numberstyle</i>
----------------	---------------------------------------

<u>numberstyle</u>	<i>numbers</i> possible values are <i>none</i> (default) and <i>left</i> (to add tinny numbers to the left of the listing). With <i>numberstyle</i> one can redefine the numbering style.
--------------------	---

<u>stringstyle</u>	<i>stringstyle</i> and <i>commentstyle</i>
<u>codestyle</u>	to redefine <i>strings</i> and <i>comments</i> formatting style.

<u><code>bckgndcolor</code></u>	<code>bckgndcolor</code> to change the listing background's color.
<u><code>codeprefix</code></u> <u><code>resultprefix</code></u>	<code>codeprefix</code> and <code>resultprefix</code> those set the <code>codeprefix</code> (default: L <sup>A</sup> T <sub>E</sub> X Code:) and <code>resultprefix</code> (default: L <sup>A</sup> T <sub>E</sub> X Result:)
<u><code>parindent</code></u>	<code>parindent</code> Sets the indentation to be used when 'demonstrating' L <sup>A</sup> T <sub>E</sub> X code ( <code>\tsdemo</code> ). Defaults to whatever value <code>\parindent</code> was when the package was first loaded.
<u><code>ruleht</code></u>	<code>ruleht</code> When typesetting the 'code demo' ( <code>\tsdemo</code> ) a set of rules is drawn. The Default, 1, equals to <code>\arrayrulewidth</code> (usually 0.4pt).
<u><code>basicstyle</code></u> <u><small>new:</small> 2023/11/18</u>	<code>basicstyle</code> Sets the base font style used when typesetting the 'code demo', default being <code>\footnotesize\ttfamily</code>

### 3 codedescribe Package

This package aims at minimizing the number of commands, having the object kind (if a macro, or a function, or environment, or variable, or key ...) as a parameter, allowing for a simple 'extension mechanism': other object types can be easily introduced without having to change, or add commands.

#### 3.1 Package Options

It has a single package option:

`nolisting` it will suppress the `codelisting` package load. In case it's not necessary or one wants to use a differen package for L<sup>A</sup>T<sub>E</sub>X code listing.

#### 3.2 Object Type keys

The applied text format is defined in terms of `<obj-types>`, which are defined in terms of `<format-groups>` and each one defines a 'formatting function', 'font shape', bracketing, etc. to be applied.

##### 3.2.1 Format Keys

There is a set of primitive `<format-keys>` used to define `<format-groups>` and `<obj-types>`, which are:

<code>meta</code>	to typeset between angles,
<code>xmeta</code>	to typeset <code>*verbatim*</code> between angles,
<code>verb</code>	to typeset <code>*verbatim*</code> ,
<code>xverb</code>	to typeset <code>*verbatim*</code> , suppressing all spaces,
<code>code</code>	to typeset <code>*verbatim*</code> , suppressing all spaces and replacing a TF by <code>\underline{TF}</code> ,
<code>nofmt</code>	in case of a redefinition, to remove the 'base' formatting,
<code>slshape</code>	to use a slanted font shape,
<code>itshape</code>	to use an italic font shape,
<code>noshape</code>	in case of a redefinition, to remove the 'base' shape,
<code>lbracket</code>	defines the left bracket (when using <code>\tsargs</code> ). <b>Note:</b> this key must have an associated value,

<code>rbracket</code>	defines the right bracket (when using <code>\tsargs</code> ). <b>Note:</b> this key must have an associated value,
<code>color</code>	defines the text color. <b>Note:</b> this key must have an associated value (a color, as understood by <code>xcolor</code> package).

### 3.2.2 Format Groups

Using `\defgroupfmt` one can (re-)define custom `<format-groups>`. There is, though, a set of pre-defined ones as follow:

<code>meta</code>	which sets <code>meta</code> and <code>color</code>
<code>verb</code>	which sets <code>color</code>
<code>oarg</code>	which sets <code>meta</code> and <code>color</code>
<code>code</code>	which sets <code>code</code> and <code>color</code>
<code>syntax</code>	which sets <code>color</code>
<code>keyval</code>	which sets <code>slshape</code> and <code>color</code>
<code>option</code>	which sets <code>color</code>
<code>defaultval</code>	which sets <code>color</code>
<code>env</code>	which sets <code>slshape</code> and <code>color</code>
<code>pkg</code>	which sets <code>slshape</code> and <code>color</code>

**Note:** `color` was used in the list above just as a 'reminder' that a color is defined/associated with the given group.

### 3.2.3 Object Types

Using `\defobjectfmt` one can (re-)define custom `<obj-types>`. Similarly, there is a set of predefined ones, as follow:

<code>arg, meta</code>	based on (group) <code>meta</code>
<code>verb, xverb</code>	based on (group) <code>verb</code> plus <code>verb</code> or <code>xverb</code>
<code>marg</code>	based on (group) <code>meta</code> plus brackets
<code>oarg, parg, xarg</code>	based on (group) <code>oarg</code> plus brackets
<code>code, macro, function</code>	based on (group) <code>code</code>
<code>syntax</code>	based on (group) <code>syntax</code>
<code>keyval, key, keys, values</code>	based on (group) <code>keyval</code>
<code>option</code>	based on (group) <code>option</code>
<code>defaultval</code>	based on (group) <code>defaultval</code>
<code>env</code>	based on (group) <code>env</code>
<code>pkg, pack</code>	based on (group) <code>pkg</code>

### 3.2.4 Customization

One can add user defined groups/objects or change the pre-defined ones with the following commands:

---

<code>\defgroupfmt</code>	<code>\defgroupfmt {&lt;format-group&gt;} {&lt;format-keys&gt;}</code>
new: 2023/05/16	<code>&lt;format-group&gt;</code> is the name of the new group (or one being redefined, which can be one of the standard ones). <code>&lt;format-keys&gt;</code> is any combination of the keys defined in 3.2.1

---

For example, one can redefine the `code` group standard color with `\defgroupfmt{code}{color=red}` and all `obj-types` based on it will be typeset in red (in the standard case: `code`, `macro` and `function` objects).

---

<code>\defobjectfmt</code>	<code>\defobjectfmt {&lt;obj-type&gt;} {&lt;format-group&gt;} {&lt;format-keys&gt;}</code>
new: 2023/05/16	<code>&lt;obj-type&gt;</code> is the name of the new <code>&lt;object&gt;</code> being defined (or redefined), <code>&lt;format-group&gt;</code> is the base group to be used. <code>&lt;format-keys&gt;</code> allows for further differentiation.

---

For instance, the many optional `<*arg>` are defined as follow:

```

\colorlet {c__codedesc_oarg_color} { gray!90!black }

\defgroupfmt {oarg} { meta , color=c__codedesc_oarg_color }

\defobjectfmt {oarg} {oarg} { lbracket={[] , rbracket={[] } }
\defobjectfmt {parg} {oarg} { lbracket={() , rbracket={() } }
\defobjectfmt {xarg} {oarg} { lbracket={< , rbracket={> } }

```

### 3.3 Environments

---

**codedescribe**      `\begin{codedescribe} [⟨obj-type⟩] {⟨csv-list⟩}`

new: 2023/05/01  
update: 2023/05/1  
NB: this is an example

---

...  
`\end{codedescribe}`

This is the main environment to describe *Macros*, *Functions*, *Variable*, *Environments* and *etc.* `⟨csv-list⟩` is typeset in the margin. The optional `⟨obj-type⟩` defines the object-type format.

**Note 1:** One can change the rule color with the key `rulecolor`, for instance `\begin{codedescribe}[rulecolor=white]` will remove the rules.

**Note 2:** Besides that, one can use the keys `new`, `update` and `note` to further customize it as: `\begin{codedescribe} [new=2023/05/01, update=2023/05/1, note={this is an example}]`

**Note 3:** Finally, one can use `EXP` and `rEXP` to add a star ★ or a hollow star ☆, as per `expl3/doc3` conventions (if expandable, restricted expandable or not).

---

**codesyntax**      `\begin{codesyntax}`

...  
`\end{codesyntax}`

The `codesyntax` environment sets the fontsize and activates `\obeylines`, `\obeyspaces`, so one can list macros/cmds/keys use, one per line.

**Note:** `codesyntax` environment shall appear only once, inside of a `codedescribe` environment. Take note, as well, this is not a verbatim environment!

For example, the code for `codedescribe` (entry above) is:

LaTeX Code:

```

\begin{codedescribe}[env,new=2023/05/01,update=2023/05/1,note={this is an example}]{
  codedescribe}
  \begin{codesyntax}
    \tsmacro{\begin{codedescribe}}[obj-type]{csv-list}
    \ldots
    \tsmacro{\end{codedescribe}}{}
  \end{codesyntax}
  This is the main ...
\end{codedescribe}

```

---

**describelist**      `\begin{describelist} [⟨item-indent⟩] {⟨obj-type⟩}`  
**describelist\***    `.. \describe {⟨item-name⟩} {⟨item-description⟩}`  
                   `.. \describe {⟨item-name⟩} {⟨item-description⟩}`  
                   ...  
                   `\end{describelist}`

This sets a *description* like 'list'. In the non-star version the `⟨items-name⟩` will be typeset on the marginpar. In the star version, `⟨item-description⟩` will be indented by `⟨item-indent⟩` (defaults to: 20mm). `⟨obj-type⟩` defines the object-type format used to typeset `⟨item-name⟩`.

---

<code>\describe</code>	<code>\describe {&lt;item-name&gt;} {&lt;item-description&gt;}</code>
------------------------	---

---

This is the *describe*list companion macro. In case of the *describe\**, <item-name> will be typeset in a box <item-ident> wide, so that <item-description> will be fully indented, otherwise <item-name> will be typed in the marginpar.

### 3.4 Commands

---

<code>\typesetobj</code>	<code>\typesetobj [&lt;obj-type&gt;] {&lt;csv-list&gt;}</code>
<code>\tsobj</code>	<code>\tsobj [&lt;obj-type&gt;] {&lt;csv-list&gt;}</code>

---

This is the main typesetting command (most of the others are based on this). It can be used to typeset a single 'object' or a list thereof. In the case of a list, each term will be separated by commas. The last two by *sep* (defaults to: and).

**Note:** One can change the last 'separator' with the key *sep*, for instance `\tsobj [env,sep=or] {}` (in case one wants to produce an 'or' list of environments). Additionally, one can use the key *comma* to change the last separator to a single comma, like `\tsobj [env,comma] {}`.

---

<code>\typesetargs</code>	<code>\typesetargs [&lt;obj-type&gt;] {&lt;csv-list&gt;}</code>
<code>\tsargs</code>	<code>\tsargs [&lt;obj-type&gt;] {&lt;csv-list&gt;}</code>

---

Those will typeset <csv-list> as a list of parameters, like [*arg1*] [*arg2*] [*arg3*], or {<arg1>} {<arg2>} {<arg3>}, etc. <obj-type> defines the formatting AND kind of brackets used (see 3.2): `[]` for optional arguments (oarg), `{}` for mandatory arguments (marg), and so on.

---

<code>\typesetmacro</code>	<code>\typesetmacro {&lt;macro-list&gt;} [&lt;oargs-list&gt;] {&lt;margs-list&gt;}</code>
<code>\tsmacro</code>	<code>\tsmacro {&lt;macro-list&gt;} [&lt;oargs-list&gt;] {&lt;margs-list&gt;}</code>

---

This is just a short-cut for  
`\tsobj[code]{macro-list} \tsargs[oarg]{oargs-list} \tsargs[marg]{margs-list}`.

---

<code>\typesetmeta</code>	<code>\typesetmeta {&lt;name&gt;}</code>
<code>\tsmeta</code>	<code>\tsmeta {&lt;name&gt;}</code>

---

Those will just typeset <name> between left/right 'angles' (no other formatting).

---

<code>\typesetverb</code>	<code>\typesetverb [&lt;obj-type&gt;] {&lt;verbatim text&gt;}</code>
<code>\tsverb</code>	<code>\tsverb [&lt;obj-type&gt;] {&lt;verbatim text&gt;}</code>

---

Typesets <verbatim text> as is (verbatim...). <obj-type> defines the used format. The difference with `\tsobj [verb]{something}` is that <verbatim text> can contain commas (which, otherwise, would be interpreted as a list separator in `\tsobj`).

**Note:** This is meant for short expressions, and not multi-line, complex code (one is better of, then, using 2.2). <verbatim text> must be balanced ! otherwise, some low level T<sub>E</sub>X errors may pop out.

---

<code>\typesetmarginnote</code>	<code>\typesetmarginnote {&lt;note&gt;}</code>
<code>\tsmarginnote</code>	<code>\tsmarginnote {&lt;note&gt;}</code>

---

Typesets a small note at the margin.

---

<i>tsremark</i>	<code>\begin{tsremark} [⟨NB⟩]</code> <code>\end{tsremark}</code>
-----------------	---

The environment body will be typeset as a text note. `⟨NB⟩` (defaults to Note:) is the note begin (in boldface). For instance:

LaTeX Code:

LaTeX Result:

---

```
Sample text. Sample test.
\begin{tsremark}[N.B.]
  This is an example.
\end{tsremark}
```

---



---

Sample text. Sample test.  
**N.B.** This is an example.

---

### 3.5 Auxiliary Command / Environment

In case the used Document Class redefines the `\maketitle` command and/or *abstract* environment, alternatives are provided (based on the article class).

---

<code>typesettitle</code>	<code>\typesettitle {⟨title-keys⟩}</code>
<code>tstitle</code>	<code>\tstitle {⟨title-keys⟩}</code>

---

This is based on the `\maketitle` from the *article* class. The `⟨title-keys⟩` are:

<code>title</code>	The used title.
<code>author</code>	Author's name. It's possible to use <code>\footnote</code> command in it.
<code>date</code>	Title's date.

---

<i>tsabstract</i>	<code>\begin{tsabstract}</code> ... <code>\end{tsabstract}</code>
-------------------	---

This is the *abstract* environment from the *article* class.

---

<code>typesetdate</code>	<code>\typesetdate</code>
<code>tsdate</code>	<code>\tsdate</code>

---

<code>new: 2023/05/16</code>	This provides the current date (Month Year, format).
------------------------------	--

---