The *cloze* package*

Josef Friedrich
josef@friedrich.rocks
github.com/Josef-Friedrich/cloze

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Contents

1 Introduction

cloze is a plain TEX or a LATEX package to generate cloze texts. It uses the capabilities of the modern TEX engine *LuaTEX*. Therefore, you must use LuaTEX or LuaLATEX to create documents containing gaps.

`lualatex cloze-text.tex` or `luatex cloze-text.tex`

The main feature of the package is that the formatting doesn't change when using the `hide` and `show` (→ 2.3.10) options.

Lorem ipsum *dolor sit* amet, consectetur *adipisicing* elit, sed do eiusmod tempor incididunt ut labore et *dolore magna* aliqua. Ut enim ad minim veniam, quis nostrud *exercitation* ullamco laboris nisi ut *aliquip* ex ea commodo consequat.

The command `\clozeset{hide}` only shows gaps. When you put both texts on top of each other you will see that they perfectly match.

Lorem ipsum _____ amet, consectetur _____ elit, sed do eiusmod tempor incididunt ut labore et _____ aliqua. Ut enim ad minim veniam, quis nostrud _____ ullamco laboris nisi ut _____ ex ea commodo consequat.

2 Usage

2.1 Interfaces

The main difference between the plain TEX and the LATEX interface is option handling. In LATEX options can be set using a key-value pairs. In plain TEX the only possibility to set options in plain TEX is using the `\clozesetoption` (→ 2.3.2).

2.1.1 The plain TEX interface

```
\input cloze.tex
\clozesetoption{margin}{1cm}
\clozeshow
Lorem \cloze{ipsum} dolor.
\bye
```

2.1.2 The LATEX interface

```
\documentclass{article}
\usepackage[show,margin=1cm]{cloze}
\begin{document}
```

```
Lorem \cloze{ipsum} dolor.
\end{document}
```

2.2 The commands and environments

There are the commands `\cloze`, `\clozefix`, `\clozefil`, `\clozenol`, `\clozeparcmd`, `\clozestrike` and the environments `clozepar` and `clozebox` to generate cloze texts.

2.2.1 `\cloze`

`\cloze` `\cloze[`⟨*options*⟩`]{`⟨*some text*⟩`}`: The command `\cloze` is similar to a command that offers the possibility to underline the texts. `\cloze` does not prevent line breaks. The width of a gap depends on the number of letters and the font used. The only option which affects the widths of a gap is the option `margin` (→ 2.3.12).

Lorem ipsum *dolor* sit amet, *consectetur* adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore *magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi* ut aliquip ex ea commodo consequat.

It is possible to convert a complete paragraph into a 'gap'. But don't forget: There is a special environment for this: `clozepar` (→ 2.2.7).

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

The command `\cloze` doesn't change the behavior of the hyphenation. Let's try some long German words:

es *Telekommunikationsüberwachung* geht *Unternehmenssteuerfortentwicklungsgesetz* *Abteilungsleiterin* *Oberkommisarin* auch *Fillialleiterin* kurz.

2.2.2 `\clozesetfont`

`\clozesetfont` The gap font can be changed by using the command `\clozesetfont`. `\clozesetfont` redefines the command `\clozefont` which contains the font definition. Thus, the command `\clozesetfont{\Large}` has the same effect as `\def\clozefont{\Large}`

Excepteur sint occaecat cupidatat non proident.

Please do not put any color definitions in `\clozesetfont`, as it won't work. Use the option `textcolor` instead (→ 2.3.11).

`\clozesetfont{\ttfamily\normalsize}` changes the gap text for example into a normal sized typewriter font.

Excepteur sint occaecat cupidatat non proident.

2.2.3 \clozefix

\clozefix

\clozefix[⟨*options*⟩]{⟨*some text*⟩}: The command \clozefix creates gaps with a fixed width. The clozes are default concering the width 2cm.

Lorem ipsum dolor sit amet:

1. *consectetur*
2. *adipisicing*
3. *elit*

sed do eiusmod.

Gaps with a fixed width are much harder to solve.

Lorem ipsum dolor *sit* amet, *consectetur* adipisicing elit, sed do eiusmod tempor incididunt *ut* labore et dolore magna aliqua.

Using the option align you can make nice tabulars like this:

Composer	Life span
Joseph Haydn	*1723-1809*
Wolfgang Amadeus Mozart	*1756-1791*
Ludwig van Beethoven	*1770-1827*

2.2.4 \clozenol

\clozenol

\clozenol[⟨*options*⟩]{⟨*some text*⟩}: The macro name clozenol stands for *"cloze no line"*. As the the name suggests this macro typesets cloze texts without a line. \clozenol is a convenient abbreviation for \cloze[thickness=0pt]{text}.

```
Lorem \clozenol{ipsum dolor} sit amet.
```

Lorem *ipsum dolor* sit amet.

```
Lorem \clozenol[textcolor=green]{ipsum dolor} sit amet.
```

Lorem *ipsum dolor* sit amet.

The next examples are showing that \clozenol behaves exactly as \clozenol with the option thickness=0pt (\cloze[thickness=0pt]) set: The text layout doesn't change if we are hiding the gaps and the hidden text is not really hidden. It is removed. It can not be copied.

Lorem ipsum *dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua* sit amet.

Now hide the text

Lorem ipsum

sit amet.

2.2.5 `\clozefil`

`\clozefil` `\clozefil[`⟨*options*⟩`]{`⟨*some text*⟩`}`: The name of the command is inspired by `\hfil`, `\hfill`, and `\hfilll`. Only `\clozefil` fills out all available horizontal spaces with a line.

Lorem ipsum dolor sit amet, *consectetur adipisicing elit, sed do eiusmod.*
Ut enim *ad minim veniam* exercitation.

2.2.6 `\clozeextend`

`\clozeextend` `\clozeextend[`⟨*spaces*⟩`]`: The command `\clozeextend` adds some invisible placeholders to extend some cloze texts with blank space.

```
\begin{itemize}
\item \clozefil{Lorem ipsum dolor sit amet, consectetur adipisicing
elit, sed do eiusmod tempor incididunt ut labore et dolore magna
aliqua.}
\item \clozefil{Ut enim ad minim veniam \clozeextend[20]}
\item \clozefil{quis nostrud \clozeextend[20]}
\end{itemize}
```

- *Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.*
- *Ut enim ad minim veniam*
- *quis nostrud*

2.2.7 `clozepar`

`clozepar` `\begin{clozepar}[`⟨*options*⟩`]` …*some text* …`\end{clozepar}`: The environment `clozepar` transforms a complete paragraph into a cloze text. The options `align`, `margin` and `width` have no effect on this environment.

Lorem ipsum dolor sit amet, consectetur adipisicing elit ullamco laboris nisi.
Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum.
Excepteur sint occaecat cupidatat non proident.

2.2.8 `\clozeparcmd`

`\clozeparcmd` `\clozeparcmd`: The command `\clozeparcmd` is the macro version of the environment `clozepar`.

2.2.9 `clozebox`

`clozebox` `\begin{clozebox}`*`[⟨options⟩]`* *…some text …*`\end{clozebox}`: The environment `clozebox` surrounds a text with a box. The starred version omits the line around the box. Use the options `boxwidth` and `boxheight` to specify the dimensions of the box. By default the width of the box is `\linewidth`. The height of the box is determined by the amount of text. This environment is realized by a combination of the `minipage` environment surrounded by a `\fbox`. For the cloze text the macro `\clozenol` is reused. New paragraphs are not allowed inside a cloze box. Use two backslashes multiple times `\\` instead.

```
\begin{clozebox}
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod
tempor incididunt ut labore et dolore magna aliqua.
\end{clozebox}
```

`\clozehide`

`\clozeshow`

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.

Like with all cloze macros and environments the hidden text vanishes from the rendered file. The next example demonstrates this by showing a different background color:

`\clozehide`:

`\clozeshow`:

Lorem ipsum dolor sit amet.

2.2.9.1 Option boxwidth

See the documentation about the option (→ 2.3.8).

```
\begin{clozebox}[boxwidth=5cm]
```

boxwidth: 2.5cm; Lorem ipsum dolor sit amet …

boxwidth: 3cm; Lorem ipsum dolor sit amet …

boxwidth: 4cm; Lorem ipsum dolor sit amet …

2.2.9.2 Option boxheight

See the documentation about the option (→ 2.3.7).

```
\begin{clozebox}[boxheight=3cm]
```

boxheight: 3cm; Lorem ipsum dolor sit amet …

boxheight: 2cm; Lorem ipsum dolor sit amet …

boxheight: 1cm; Lorem ipsum dolor sit amet …

2.2.9.3 starred

The starred version omits the line around the box.

```
\begin{clozebox}*[boxheight=5cm]
Lorem ...
\end{clozebox}
```

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.

2.2.10 clozespace

clozespace

`\begin{clozespace}[`⟨*options*⟩`]` …*some text* …`\end{clozespace}`: If you are using a bigger font for the cloze text as for the normal text, you are getting irregular distances between the lines:

```
\clozesetfont{\Huge\fontspec{Kalam}}
Today in the Discovery ...
```

Today in the Discovery Lab we learned about three types of spacecraft that are helping us explore Mars. The spacecraft are on Mrs. Bratt's Principal's Reading Challenge board. One type of spacecraft is the orbiter.

With the environment `clozespace` you are able to restore the regular balanced line spacing. The default value for the option `spacing` is `1.6`. Also take a look in the section about the option `spacing` (→ 2.3.13).

```
\begin{clozespace}[spacing=2]
...
\end{clozespace}
```

Today in the Discovery Lab we learned about three types of spacecraft that are helping us explore Mars. The spacecraft are on Mrs. Bratt's Principal's Reading Challenge board. One type of spacecraft is the orbiter.

The environment `clozespace` uses the package setspace in the background for setting the spacing between the lines.

2.2.11 \clozeline

\clozeline

`\clozeline[`⟨*options*⟩`]`: To create a cloze line of a certain width, use the command `\clozeline`. The default width of the line is `2cm`. In combination with the other cloze commands you can create for example an irregular alignment of the cloze text.

```
Ut enim ad
\clozeline[width=1cm]\cloze{minim}\clozeline[width=3cm]
minim veniam
```

Ut enim ad _____*minim*_____ minim veniam,

2.2.12 `\clozelinefil`

`\clozelinefil` `\clozelinefil[`⟨*options*⟩`]`: This command `\clozelinefil` fills the complete available horizontal space with a line. Moreover, `\clozelinefil` was used to create `\clozefil`.

Lorem_____

2.2.13 `\clozestrike`

`\clozestrike` `\clozestrike[`⟨*options*⟩`]{`⟨*wrong text*⟩`}{`⟨*correct text*⟩`}`: This macro can be useful for worksheets that contain intentionally errors. The pupils have to find and cross out the mistakes and write the right solution on top of the errors.

```
Wolfgang Amadeus Mozart was born in \clozestrike{Vienna}{Salzburg}.
```

Wolfgang Amadeus Mozart was born in ~~Vienna~~ *Salzburg*.

The option `linecolor` has no effect on the lines produced by the macro `\clozestrike`. The line color and and the text color are both the same, because the pupils have to draw the lines.

```
Mozart's father was called
\clozestrike[textcolor=red]{Ludwig}{Leopold} Mozart.
```

Mozart's father was called ~~Ludwig~~ *Leopold* Mozart.

2.3 The options

2.3.1 Local and global options

The *cloze* package distinguishs between *local* and *global* options. Besides the possiblity to set *global* options in the `\usepackage[`⟨*global options*⟩`]{`⟨*cloze*⟩`}` declaration, the cloze package offers a special command to set *global* options: `\clozeset{`⟨*global options*⟩`}`

2.3.2 `\clozesetoption`

`\clozesetoption` `\clozesetoption{`⟨*key*⟩`}{`⟨*value*⟩`}`: Set a single option. In plain TEX the command sets the options only in the global option space.

2.3.3 \clozeset

\clozeset `\clozeset{`⟨*global options*⟩`}`: The command can set *global* options for each paragraph.

```
\clozeset{textcolor=red} Lorem \cloze{ipsum} dolor \par
\clozeset{textcolor=green} Lorem \cloze{ipsum} dolor
```

Lorem _ipsum_ dolor
Lorem _ipsum_ dolor

`\clozeset` does not change the options within a paragraph. As you can see in the example below the last `\clozeset` applies the color green for both gaps.

```
\clozeset{textcolor=red} Lorem \cloze{ipsum} dolor
\clozeset{textcolor=green} Lorem \cloze{ipsum} dolor
```

Lorem _ipsum_ dolor Lorem _ipsum_ dolor

2.3.4 \clozereset

\clozereset `\clozereset`: The command resets all *global* options to the default values. It has no effect on the *local* options.

```
\clozeset{
  thickness=3mm,
  linecolor=yellow,
  textcolor=magenta,
  margin=-2pt
}
```

Very *silly* global *options*.

```
\clozereset
```

Relax! We can reset _those_ options.

2.3.5 \clozeshow and \clozehide

\clozeshow \clozehide `\clozeshow` and `\clozehide`: This commands are shortcuts for `\clozeset{`⟨*show*⟩`}` and `\clozeset{`⟨*hide*⟩`}`.

```
\clozehide
```

Lorem _____ amet, consectetur _____ elit.

```
\clozeshow
```

Lorem *ipsum dolor sit* amet, consectetur *adipisicing* elit.

2.3.6 `align`

`[align=`⟨*left/center/right*⟩`]`: Only the macro `\clozefix` (→ 2.2.3) takes the option `align` into account. Possible values are `left`, `center` and `right`. This option only makes sense, if the width of the line is larger than the width of the text.

Lorem ipsum (`left`)
Lorem ipsum (`center`)
Lorem ipsum (`right`)

2.3.7 `boxheight`

`boxheight` specifies the height of a cloze box. This option has only an effect on the environment `clozebox` (→ 2.2.9). An example can be found in the section about the environment (→ 2.2.9.2).

2.3.8 `boxwidth`

`boxwidth` specifies the width of a cloze box. This option has only an effect on the environment `clozebox` (→ 2.2.9). An example can be found in the section about the environment (→ 2.2.9.1).

2.3.9 `distance`

`[distance=`⟨*dimen*⟩`]`: The option `distance` specifies the spacing between the baseline of the text and the gap line. The larger the dimension of the option `distance`, the more moves the line down. Negative values cause the line to appear above the baseline. The default value is `1.5pt`.

Lorem ipsum dolor sit amet. (`1.5pt`)
Lorem ipsum dolor sit amet. (`3pt`)
Lorem ipsum dolor sit amet. (`-3pt`)

2.3.10 `hide` and `show`

`[hide]` and `[show]`: By default the cloze text is displayed. Use the option `hide` to remove the cloze text from the output. If you accidentally specify both options – `hide` and `show` – the last option "wins".

Lorem ipsum _____, consectetur _____ elit. (`hide`)
Lorem ipsum *dolor sit amet*, consectetur *adipisicing* elit. (`show`)
Lorem ipsum _____, consectetur _____ elit. (`show,hide`)
Lorem ipsum *dolor sit amet*, consectetur *adipisicing* elit. (`hide,show`)

2.3.11 `linecolor` and `textcolor`

`[linecolor=`⟨*color name*⟩`]` and `[textcolor=`⟨*color name*⟩`]`: Values for both color options are color names used by the xcolor package. To define your own color use the following command:

```
\definecolor{myclozecolor}{rgb}{0.1,0.4,0.6}
\cloze[textcolor=myclozecolor]{Lorem ipsum}
```

Lorem ipsum dolor sit amet, consectetur (`myclozecolor`)
Lorem ipsum dolor sit amet, consectetur (`red`)
Lorem ipsum dolor sit amet, consectetur (`green`)

You can use the same color names to colorize the cloze lines.

Lorem ipsum dolor sit amet, consectetur (`myclozecolor`)
Lorem ipsum dolor sit amet, consectetur (`red`)
Lorem ipsum dolor sit amet, consectetur (`green`)

And now hide the clozes:

_____ (`myclozecolor`)
_____ (`red`)
_____ (`green`)

2.3.12 `margin`

`[margin=`⟨*dimen*⟩`]`: The option `margin` indicates how far the line sticks up from the text. The option can be used with the commands `\cloze`, `\clozefix` and `\clozefil`. The default value of the option is `3pt`.

Lorem ipsum *dolor* sit amet. (`0pt`)
Lorem ipsum *dolor* sit amet. (`5mm`)
Lorem ipsum *dolor* sit amet. (`1cm`)
Lorem ipsum *dolor* sit amet. (`6em`)

Lorem ipsum*dolor*sit amet. (-4pt)

Is a punctation mark placed directly after a gap, then the line breaks after this punctation mark. Even the most large value of `margin` does not affect this behavior.

Lorem , *ipsum* . *dolor* ; *sit* : *amet* , *consectetur* . *adipisicing* ; *elit* : *sed* , *do* . *eiusmod* ; *tempor* .

2.3.13 `spacing`

`[spacing=`⟨*number*⟩`]`: This option provides support for setting the spacing between lines. A larger font used for the cloze texts needs more line space to avoid unsteady line distances. This option only affects the environment `clozespace` (→ 2.2.10).

2.3.14 `thickness`

`[thickness=`⟨*dimen*⟩`]`: The option `thickness` indicates how thick the line is. The option `distance` (→ 2.3.9) is not affected by this option, because the bottom of the line moves down. The default value of this option is `0.4pt`.

Lorem *ipsum dolor sit* amet. (0.01pt)
Lorem *ipsum dolor sit* amet. (1pt)
Lorem *ipsum dolor sit* amet. (2pt)

2.3.15 `width`

`[width=`⟨*dimen*⟩`]`: The only command which can be changed by the option `width` is `\clozefix` (→ 2.2.3). The default value of the option is `2cm`.

Lorem *dolor* amet. (3cm)
Lorem *dolor* amet. (5cm)
Lorem *dolor* amet. (7cm)

2.4 Handwriting fonts from CTAN and TEX Live

If you want to imitate a hand-filled worksheet, then some handwriting fonts are suitable for this purpose. This section is intended to provide an overview of handwriting fonts available on CTAN and TEX Live. The fonts are listed in alphabetical order:

LobsterTwo

CTAN: lobster2
TEX Live: `tlmgr install lobster2`

Font selection: `\clozesetfont{\fontspec{LobsterTwo}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Miama Nueva

CTAN: miama
TEX Live: `tlmgr install miama`
Font selection: `\clozesetfont{\fontspec{Miama Nueva}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

QT Brush Stroke

CTAN: qualitype
TEX Live: `tlmgr install qualitype`
Font selection: `\clozesetfont{\fontspec{QT Brush Stroke}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

QT Florencia

CTAN: qualitype
TEX Live: `tlmgr install qualitype`
Font selection: `\clozesetfont{\fontspec{QT Florencia}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

QT Handwriting

CTAN: qualitype
TEX Live: `tlmgr install qualitype`
Font selection: `\clozesetfont{\fontspec{QT Handwriting}}`

Lorem __ipsum__ dolor sit amet, consetetur __sadipscing elitr, sed diam nonumy eirmod tempor__ invidunt ut __labore et dolore magna aliquyam erat__, sed __diam__ voluptua.

QT Linostroke

CTAN: qualitype
TEX Live: `tlmgr install qualitype`
Font selection: `\clozesetfont{\fontspec{QT Linostroke}}`

Lorem __ipsum__ dolor sit amet, consetetur __sadipscing elitr, sed diam nonumy eirmod tempor__ invidunt ut __labore et dolore magna aliquyam erat__, sed __diam__ voluptua.

QT Merry Script

CTAN: qualitype
TEX Live: `tlmgr install qualitype`
Font selection: `\clozesetfont{\fontspec{QT Merry Script}}`

Lorem __ipsum__ dolor sit amet, consetetur __sadipscing elitr, sed diam nonumy eirmod tempor__ invidunt ut __labore et dolore magna aliquyam erat__, sed __diam__ voluptua.

QT Slogantype

CTAN: qualitype
TEX Live: `tlmgr install qualitype`
Font selection: `\clozesetfont{\fontspec{QT Slogantype}}`

Lorem __ipsum__ dolor sit amet, consetetur __sadipscing elitr, sed diam nonumy eirmod tempor__ invidunt ut __labore et dolore magna aliquyam erat__, sed __diam__ voluptua.

2.5 Handwriting fonts from Google Fonts

You can get many more free handwriting fonts from Google Fonts. This section shows only a selection. I personally use the font named *Kalam* for my worksheets. All Google Fonts are available in a Git respository.

```
git clone https://github.com/google/fonts.git
```

The fonts are listed in alphabetical order:

Annie Use Your Telescope

URL: https://fonts.google.com/specimen/Annie+Use+Your+Telescope
Font selection: `\clozesetfont{\fontspec{Annie Use Your Telescope}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Architects Daughter

URL: https://fonts.google.com/specimen/Architects+Daughter
Font selection: `\clozesetfont{\fontspec{Architects Daughter}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Bad Script

URL: https://fonts.google.com/specimen/Bad+Script
Font selection: `\clozesetfont{\fontspec{Bad Script}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Caveat

URL: https://fonts.google.com/specimen/Caveat
Font selection: `\clozesetfont{\fontspec{Caveat}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Cedarville Cursive

URL: https://fonts.google.com/specimen/Cedarville+Cursive
Font selection: `\clozesetfont{\fontspec{Cedarville Cursive}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Coming Soon

URL: https://fonts.google.com/specimen/Coming+Soon
Font selection: `\clozesetfont{\fontspec{Coming Soon}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Give You Glory

URL: https://fonts.google.com/specimen/Give+You+Glory
Font selection: `\clozesetfont{\fontspec{Give You Glory}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Gochi Hand

URL: https://fonts.google.com/specimen/Gochi+Hand
Font selection: `\clozesetfont{\fontspec{Gochi Hand}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed

diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Handlee

URL: https://fonts.google.com/specimen/Handlee
Font selection: `\clozesetfont{\fontspec{Handlee}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Homemade Apple

URL: https://fonts.google.com/specimen/Homemade+Apple
Font selection: `\clozesetfont{\fontspec{Homemade Apple}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Indie Flower

URL: https://fonts.google.com/specimen/Indie+Flower
Font selection: `\clozesetfont{\fontspec{Indie Flower}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Just Another Hand

URL: https://fonts.google.com/specimen/Just+Another+Hand
Font selection: `\clozesetfont{\fontspec{Just Another Hand}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Just Me Again Down Here

URL: https://fonts.google.com/specimen/Just+Me+Again+Down+Here
Font selection: `\clozesetfont{\fontspec{Just Me Again Down Here}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Kalam

URL: https://fonts.google.com/specimen/Kalam
Font selection: `\clozesetfont{\fontspec{Kalam}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Kristi

URL: https://fonts.google.com/specimen/Kristi
Font selection: `\clozesetfont{\fontspec{Kristi}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

La Belle Aurore

URL: https://fonts.google.com/specimen/La+Belle+Aurore
Font selection: `\clozesetfont{\fontspec{La Belle Aurore}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Marck Script

URL: https://fonts.google.com/specimen/Marck+Script
Font selection: `\clozesetfont{\fontspec{Marck Script}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Neucha

URL: https://fonts.google.com/specimen/Neucha
Font selection: `\clozesetfont{\fontspec{Neucha}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Nothing You Could Do

URL: https://fonts.google.com/specimen/Nothing+You+Could+Do
Font selection: `\clozesetfont{\fontspec{Nothing You Could Do}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Patrick Hand

URL: https://fonts.google.com/specimen/Patrick+Hand
Font selection: `\clozesetfont{\fontspec{Patrick Hand}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Reenie Beanie

URL: https://fonts.google.com/specimen/Reenie+Beanie
Font selection: `\clozesetfont{\fontspec{Reenie Beanie}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Seaweed Script

URL: https://fonts.google.com/specimen/Seaweed+Script
Font selection: `\clozesetfont{\fontspec{Seaweed Script}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Shadows Into Light

URL: https://fonts.google.com/specimen/Shadows+Into+Light
Font selection: `\clozesetfont{\fontspec{Shadows Into Light}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Swanky and Moo Moo

URL: https://fonts.google.com/specimen/Swanky+and+Moo+Moo
Font selection: `\clozesetfont{\fontspec{Swanky and Moo Moo}}`

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

2.6 Special application areas

This section lists examples that didn't work in older versions of the cloze package and required special treatment to work as expected.

2.6.1 The math mode

By default the package uses `\itshape` to format the cloze text. In math mode you have to reset the cloze text format by calling `\clozesetfont{}`. A known bug is: You can't show and hide a single display math formula. Only the last `\clozeshow` or `\clozehide` takes effect on the whole document. Side note: The usage of the TEX primitive syntax `$$ $$` is not recommended.

```
\clozesetfont{}
$$1 + 1 = \cloze{2}$$
\clozesetfont{\itshape}
```

$$1 + 1 = \underline{2}$$

`\[\]` should be used instead.

```
\[123 + 456 = \cloze{579}\]
```

$$123 + 456 = \underline{579}$$

A cloze inside a display math environment should work fine:

```
\begin{displaymath}
2^{\cloze{2}} = 4
\end{displaymath}
```

$$2^{\underline{2}} = 4$$

The inline math mode works too:

```
${\sqrt[3]{\cloze{8}}} = 2$ and ${\sqrt[\cloze{3}]{\cloze{8}}} = 2$
```

$\sqrt[3]{\underline{8}} = 2$ and $\sqrt[\underline{3}]{\underline{8}} = 2$

2.6.2 The `tabbing` environment

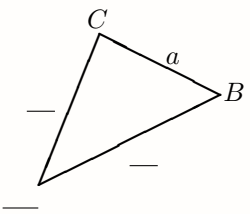
```
\begin{tabbing}
col1 \hspace{1cm} \= col2 \hspace{1cm} \= col3 \hspace{1cm} \= col4 \\
\cloze{col1} \> \> \clozefix{col3} \\
\end{tabbing}
```

col1	col2	col3	col4
col1		*col3*	

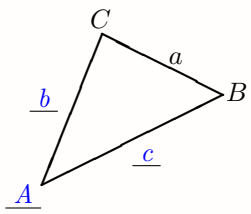
2.6.3 The `picture` environment

```
\setlength{\unitlength}{0.8cm}
\begin{picture}(4.8,3.8)
\thicklines
\put(1,0.5){\line(2,1){3}} \put(4,2){\line(-2,1){2}}
↪  \put(2,3){\line(-2,-5){1}}

\put(0.4,0.2){\cloze{A}} \put(4.05,1.9){$B$} \put(1.8,3.1){$C$}

\put(3.1,2.5){$a$} \put(0.8,1.8){\cloze{b}} \put(2.5,0.9){\cloze{c}}
\end{picture}
```

`\clozehide`:



`\clozeshow`:



2.6.4 The `tabular` environment

```
\begin{tabular}{l|l}
  \textbf{englisch} & \textbf{deutsch} \\\hline
  book & \clozefil{Buch} \\
  \clozefil{scissors} & Schere\\
  pen & \clozefil{Füller} \\
  \clozefil{pencil} & Bleistift\\
\end{tabular}
```

`\clozehide`:

englisch	**deutsch**
book	_____
_____	Schere
pen	_____
_____	Bleistift

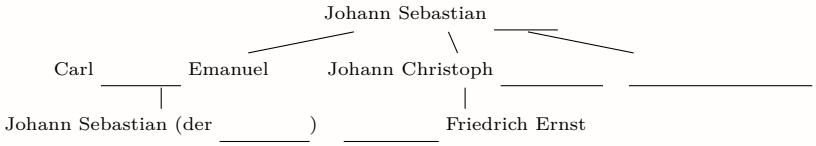
`\clozeshow`:

englisch	**deutsch**
book	*Buch*
scissors	Schere
pen	*Füller*
pencil	Bleistift

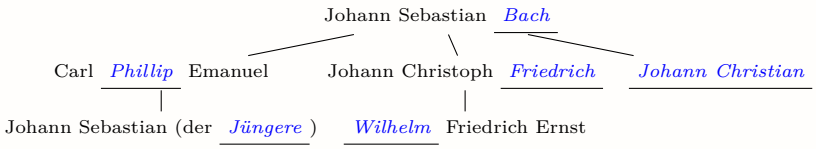
2.6.5 The package `forest`

```
\begin{forest}
[Johann Sebastian \cloze{Bach}
  [Carl \cloze{Phillip} Emanuel
    [Johann Sebastian (der \cloze{Jüngere})]
  ]
  [Johann Christoph \cloze{Friedrich}
    [\cloze{Wilhelm} Friedrich Ernst]
  ]
  [\cloze{Johann Christian}]
]
\end{forest}
```

\clozehide:

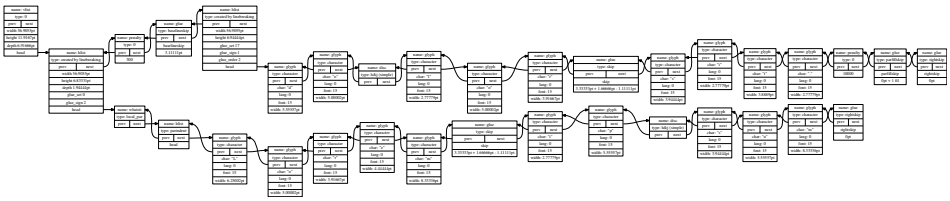


\clozeshow:

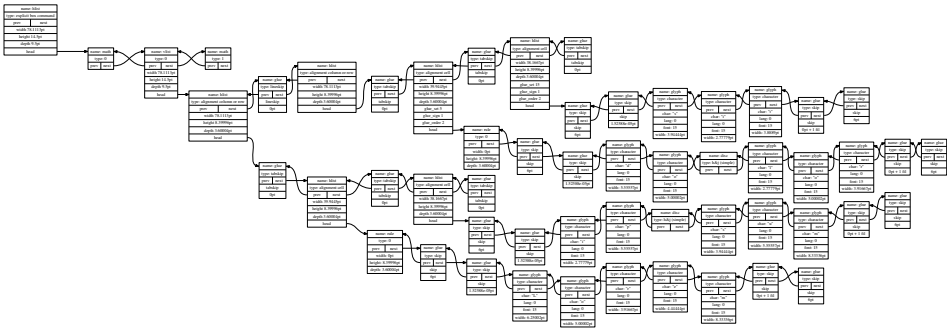


3 Some graphics for better understanding of the node tree

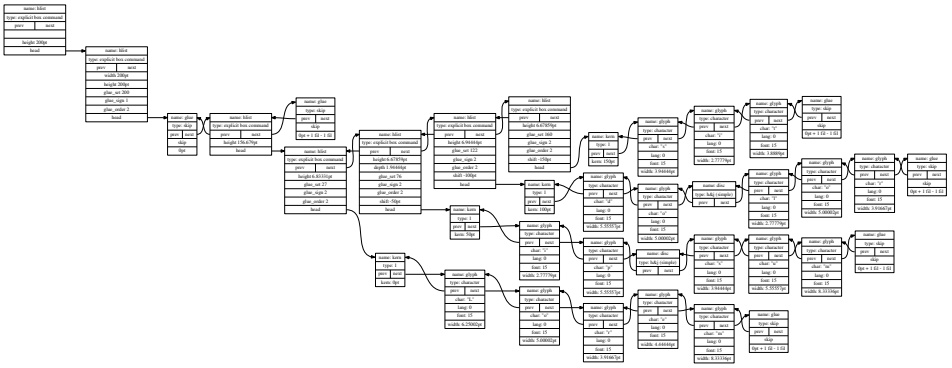
3.1 Paragraph



3.2 Tabular environment



3.3 Picture environment



4 Implementation

4.1 The file `cloze.tex`

The cloze package uses following naming conventions: Internal / private macros / commands / envirnoments are written in PascalCase, public ones are written in lowercase. Earlier versions of this package used @ characters for private macros. The lower level / private macros are now defined in the plain LuaTEX version of the package and used to set cloze text in plain LuaTEX.

```
\directlua{
  cloze = require('cloze')
}

\newif\ifclozeshow\clozeshowtrue
```

4.1.1 Internal macros

`\ClozeSetToGlobal` Set the Lua variable `registry.is_global` to `true`. All options are then stored in the variable `registry.global_options`.

```
\def\ClozeSetToGlobal{%
  \directlua{cloze.set_is_global(true)}%
}
```

`\ClozeSetToLocal` First unset the variable `registry.local_options`. Now set the Lua variable `registry.is_global` to `false`. All options are then stored in the variable `registry.local_options`.

```
\def\ClozeSetToLocal{%
  \directlua{
    cloze.unset_local_options()
    cloze.set_is_global(false)
  }%
}
```

`\ClozeGetOption` This macro is used in the documentation to show the default values of some options.

```
\def\ClozeGetOption#1{%
  \directlua{
    tex.print(cloze.get_value('#1'))
  }%
}
```

`\ClozeColor` Convert a color definiton name to a PDF colorstack string, for example convert the color name `blue` to the colorstack string `0 0 1 rg 0 0 1 RG`. The macro definition `\ClozeColor{blue}` builds itself the macro `\color@blue`, which expands

to the PDF colorstack string. The colorstack string is necessary to generate a PDF colorstack whatsit.

```
\def\ClozeColor#1{\csname\string\color@#1\endcsname}
```

`\ClozeStartMarker` At the begining `\ClozeStartMarker` registers the required Lua callbacks. Then it inserts a whatsit marker which marks the begin of a gap.

```
\def\ClozeStartMarker#1{%
  \strut\directlua{
    cloze.register('#1')
    cloze.marker('#1', 'start')
  }%
}
```

`\ClozeStopMarker` `\ClozeStopMarker` inserts a whatsit marker that marks the end of gap.

```
\def\ClozeStopMarker#1{%
  \strut\directlua{
    cloze.marker('#1', 'stop')
  }%
}
```

`\ClozeMargin` `\ClozeMargin` surrounds a text in a gap with two `kerns`.

```
\def\ClozeMargin#1{%
  \directlua{cloze.margin()}%
  #1%
  \directlua{cloze.margin()}%
}
```

4.1.2 Public plain TEX macros

`\clozesetoption` `\clozesetoption` is a wrapper for the Lua function `registry.set_option`. `\clozesetoption{`⟨*key*⟩`}{`⟨*value*⟩`}` sets a key ⟨*key*⟩ to the value ⟨*value*⟩.

```
\def\clozesetoption#1#2{%
  \ClozeSetToGlobal%
  \directlua{cloze.set_option('#1', '#2')}%
}
```

`\clozereset` The usage of the command `\clozereset` is described in detail in section (→ 2.3.4).

```
\def\clozereset{%
  \ClozeSetToGlobal%
  \directlua{cloze.reset()}%
}
```

`\clozeshow` The usage of the command `\clozeshow` is described in detail in section (→ 2.3.5).

```
\def\clozeshow{%
  \clozeshowtrue%
  \ClozeSetToGlobal%
  \clozesetoption{show}{true}%
  \clozesetoption{hide}{false}%
}
```

`\clozehide` The usage of the command `\clozehide` is described in detail in section (→ 2.3.5).

```
\def\clozehide{%
  \clozeshowfalse%
  \ClozeSetToGlobal%
  \clozesetoption{hide}{true}%
  \clozesetoption{show}{false}%
}
```

`\clozefont` The usage of the command `\clozefont` is described in detail in section (→ 2.2.2).

```
\def\clozefont{\it}
```

`\clozesetfont` The usage of the command `\clozesetfont` is described in detail in section (→ 2.2.2).

```
\def\clozesetfont#1{%
  \def\clozefont{%
    #1%
  }%
}
```

`\cloze` This is the plain LuaTEX-Version of the macro `\cloze`.

```
\def\cloze#1{%
  \ClozeStartMarker{basic}%
  {%
    \clozefont\relax%
    \ClozeMargin{#1}%
  }%
  \ClozeStopMarker{basic}%
}
```

`\clozefix` This is the plain LuaTEX-Version of `\clozefix`. The usage of the command `\clozefix` is described in detail in section (→ 2.2.3).

```
\def\clozefix#1{%
  \ClozeStartMarker{fix}%
  {%
    \clozefont\relax%
    \ClozeMargin{#1}%
```

```
  }%
  \ClozeStopMarker{fix}%
}
```

`\clozenol` This is the plain LuaTEX-Version of the macro `\clozenol`. The usage of the command `\clozenol` is described in detail in section (→ 2.2.4).

```
\def\clozenol#1{%
  \clozesetoption{thickness}{0pt}%
  \ClozeStartMarker{basic}%
  {%
    \clozefont\relax%
    \ClozeMargin{#1}%
  }%
  \ClozeStopMarker{basic}%
}
```

`\clozeline` This is the plain LuaTEX-Version of the macro `\clozeline`. The usage of the command `\clozeline` is described in detail in section (→ 2.2.11).

```
\def\clozeline{%
  \directlua{cloze.line()}%
}
```

`\clozelinefil` This is the plain LuaTEX-Version of the macro `\clozelinefil`. The usage of the command `\clozelinefil` is described in detail in section (→ 2.2.13).

```
\def\clozelinefil{%
  \strut%
  \directlua{cloze.linefil()}%
  \strut%
}
```

`\clozefil` This is the plain LuaTEX-Version of the macro `\clozefil`. The usage of the command `\clozefil` is described in detail in section (→ 2.2.5).

```
\def\clozefil#1{%
  \cloze{#1}\clozelinefil%
}
```

`\clozeparcmd` The usage of the macro `\clozeparcmd` is described in detail in section (→ 2.2.8).

```
\def\clozeparcmd#1\par {%
  \par%
  \ClozeStartMarker{par}%
  \clozefont\relax%
  #1%
  \ClozeStopMarker{par}%
  \par%
  \directlua{cloze.unregister('par')}%
}
```

4.2 The file `cloze.sty`

```
\input{cloze.tex}
```

This packages are used to build *cloze*:

4.2.1 Dependencies

The package fontspec is not necessarily required. When using LuaLaTeX it is good form to load it. Apart from this the package supplies helpful messages, when you compile a LuaLaTeX document with pdfLaTeX.

```
\RequirePackage{fontspec}
```

The package luatexbase allows to register multiple Lua callbacks.

```
\RequirePackage{luatexbase-mcb}
```

The package kvoptions takes the handling of the options.

```
\RequirePackage{kvoptions}
```

The package setspace is used by the environment `clozespace`.

```
\RequirePackage{setspace}
```

The package xcolor is required to colorize the text and the line of a gap.

```
\RequirePackage{xcolor}
```

The package xparse is used by the environment `clozebox`.

```
\RequirePackage{xparse}
```

The package stackengine is required by the command `\clozestrike{}{}`.

```
\RequirePackage{stackengine}
```

The package ulem is required by the command `\clozestrike{}{}`.

```
\RequirePackage{ulem}
\normalem

\RequirePackage{transparent}
```

Load the cloze lua module and put all return values in the variable `cloze`.

`\clozesetoption` `\clozesetoption` is a wrapper for the Lua function `registry.set_option`. `\clozesetoption{`⟨*key*⟩`}{`⟨*value*⟩`}` sets a key ⟨*key*⟩ to the value ⟨*value*⟩. The plain LuaTeX version always sets to the global options. The LuaLaTeX-version can set values both to the local and the global options store.

```
\let\clozesetoption=\undefined
\newcommand{\clozesetoption}[2]{%
  \directlua{cloze.set_option('#1', '#2')}%
}
```

`\ClozeSetLocalOptions` This macro is used in all cloze commands to handle the optional arguments. First it sets the option storage to local and then it commits the options to the package *kvoptions* via the macro `\kvsetkeys{CLZ}{}`.

```
\def\ClozeSetLocalOptions#1{%
  \ClozeSetToLocal%
  \kvsetkeys{CLZ}{#1}%
}
```

4.2.2 Options

cloze offers key-value pairs to use as options. For processing the key-value pairs we use the package kvoptions. To make all key-value pairs accessibly to Lua code, we use the declaration `\define@key{`⟨*CLZ*⟩`}{`⟨*option*⟩`}[`⟨*/*⟩`]{`⟨*…*⟩`}`. This declaration comes from the package keyval.

At start all values are declared as global options. At the Lua side all values are now stored in the `registry.global_options` table.

```
\ClozeSetToGlobal
```

We use the abbreviation `CLZ` for *cloze* as family name and prefix.

```
\SetupKeyvalOptions{
  family=CLZ,
  prefix=CLZ@
}
```

4.2.2.1 `align`

Please read the section (→ 2.3.6) how to use the option `align`. `align` affects only the command `\clozefix` (→ 2.2.3).

```
\DeclareStringOption{align}
\define@key{CLZ}{align}[]{\clozesetoption{align}{#1}}
```

4.2.2.2 `boxheight`

Please read the section (→ 2.2.9) how to use the option `boxheight`. `boxheight` affects only the environment `clozebox`. (→ 2.2.3).

```
\DeclareStringOption{boxheight}
\define@key{CLZ}{boxheight}[]{\clozesetoption{boxheight}{#1}}
```

4.2.2.3 `boxwidth`

Please read the section (→ 2.2.9) how to use the option `boxwidth`. `boxwidth` affects only the environment `clozebox`. (→ 2.2.3).

```
\DeclareStringOption{boxwidth}
\define@key{CLZ}{boxwidth}[]{\clozesetoption{boxwidth}{#1}}
```

4.2.2.4 `distance`

Please read the section (→ 2.3.9) how to use the option `distance`.

```
\DeclareStringOption{distance}
\define@key{CLZ}{distance}[]{\clozesetoption{distance}{#1}}
```

4.2.2.5 `hide`

If the option `hide` appears in the commands, `hide` will be set to *true* and `show` to *false* on the Lua side. Please read the section (→ 2.3.10) how to use the option `hide`.

```
\DeclareVoidOption{hide}{%
  \clozeshowfalse%
  \clozesetoption{hide}{true}%
  \clozesetoption{show}{false}%
}
```

4.2.2.6 `linecolor`

Please read the section (→ 2.3.11) how to use the option `linecolor`.

```
\DeclareStringOption{linecolor}
\define@key{CLZ}{linecolor}[]{%
  \clozesetoption{linecolor}{\ClozeColor{#1}}%
  \clozesetoption{linecolor_name}{#1}%
}
```

4.2.2.7 `margin`

Please read the section (→ 2.3.12) how to use the option `margin`.

```
\DeclareStringOption{margin}
\define@key{CLZ}{margin}[]{\clozesetoption{margin}{#1}}
```

4.2.2.8 `show`

If the option `show` appears in the commands, `show` will be set to *true* and `true` to *false* on the Lua side. Please read the section (→ 2.3.10) how to use the option `show`.

```
\DeclareVoidOption{show}{%
  \clozeshowtrue%
  \clozesetoption{show}{true}%
  \clozesetoption{hide}{false}%
}
```

4.2.2.9 `spacing`

Please read the section (→ 2.3.13) how to use the option `spacing`.

```
\DeclareStringOption{spacing}
\define@key{CLZ}{spacing}[]{\clozesetoption{spacing}{#1}}
```

4.2.2.10 `textcolor`

Please read the section (→ 2.3.11) how to use the option `textcolor`.

```
\DeclareStringOption{textcolor}
\define@key{CLZ}{textcolor}[]{%
  \clozesetoption{textcolor}{\ClozeColor{#1}}%
  \clozesetoption{textcolor_name}{#1}%
}
```

4.2.2.11 `thickness`

Please read the section (→ 2.3.14) how to use the option `thickness`.

```
\DeclareStringOption{thickness}
\define@key{CLZ}{thickness}[]{\clozesetoption{thickness}{#1}}
```

4.2.2.12 `width`

Please read the section (→ 2.3.15) how to use the option `width`. `width` affects only the command `\clozefix` (→ 2.2.3).

```
\DeclareStringOption{width}
\define@key{CLZ}{width}[]{\clozesetoption{width}{#1}}

\ProcessKeyvalOptions{CLZ}
```

4.2.3 Public macros

All public macros are prefixed with `\cloze`.

`\clozeset` The usage of the command `\clozeset` is described in detail in section (→ 2.3.3).

```
\newcommand{\clozeset}[1]{%
  \ClozeSetToGlobal%
  \kvsetkeys{CLZ}{#1}%
}
```

`\clozeshow` The usage of the command `\clozeshow` is described in detail in section (→ 2.3.5).

```
\let\clozeshow=\undefined
\newcommand{\clozeshow}{%
  \clozeset{show}
}
```

`\clozehide` The usage of the command `\clozehide` is described in detail in section (→ 2.3.5).

```
\let\clozehide=\undefined
\newcommand{\clozehide}{%
  \clozeset{hide}
}
```

`\cloze` The usage of the command `\cloze` is described in detail in section (→ 2.2.1).

```
\let\clozeplain=\cloze
\let\cloze=\undefined
\newcommand{\cloze}[2][]{%
  \ClozeSetLocalOptions{#1}%
  \clozeplain{#2}%
}
```

`\clozefix` The usage of the command `\clozefix` is described in detail in section (→ 2.2.3).

```
\let\clozefixplain=\clozefix
\let\clozefix=\undefined
\newcommand{\clozefix}[2][]{%
  \ClozeSetLocalOptions{#1}%
  \clozefixplain{#2}%
}
```

`\clozenol` The usage of the command `\clozenol` is described in detail in section (→ 2.2.4).

```
\let\clozenolplain=\clozenol
\let\clozenol=\undefined
\newcommand{\clozenol}[2][]{%
  \ClozeSetLocalOptions{#1}%
  \clozenolplain{#2}%
}
```

`clozepar` The usage of the environment `clozepar` is described in detail in section (→ 2.2.7).

```
\newenvironment{clozepar}[1][]%
{%
  \par%
  \ClozeSetLocalOptions{#1}%
  \ClozeStartMarker{par}%
  \clozefont\relax%
}%
{%
  \ClozeStopMarker{par}%
  \par%
  \directlua{cloze.unregister('par')}%
}
```

`clozebox` The usage of the environment `clozebox` is described in detail in section (→ 2.2.9). TODO: Realize this macro with lua code, without ugly `\color{white}` command.

```
\newsavebox{\ClozeBox}%
\NewDocumentEnvironment{clozebox}{ s O{} +b}{%
  \ClozeSetLocalOptions{#2}%
  \noindent%
  \begin{lrbox}{\ClozeBox}%
  \directlua{
    local boxheight = cloze.get_value('boxheight')
    local boxwidth = cloze.get_value('boxwidth')
    if boxheight then
      tex.print('\\begin{minipage}[t][' .. boxheight .. '][t]{' .. boxwidth .. '}')
    else
      tex.print('\\begin{minipage}[t]{' .. boxwidth .. '}')
    end
  }%
  \setlength{\parindent}{0pt}%
  \clozenol[margin=0pt]{#3}%
  \end{minipage}%
  \end{lrbox}%
  \IfBooleanTF{#1}%
    {\usebox{\ClozeBox}}%
    {\fbox{\usebox{\ClozeBox}}}%
}{}
```

`clozespace` The usage of the environment `clozespace` is described in detail in section (→ 2.2.10). TODO: Realization without setspace package.

```
\newenvironment{clozespace}[1][]%
{%
  \ClozeSetLocalOptions{#1}%
  \begin{spacing}{\directlua{tex.print(cloze.get_value('spacing'))}}%
}{\end{spacing}}
```

`\clozeline` The usage of the command `\clozeline` is described in detail in section (→ 2.2.11).

```
\let\clozelineplain=\clozeline
\let\clozeline=\undefined
\newcommand{\clozeline}[1][]{%
  \ClozeSetLocalOptions{#1}%
  \clozelineplain%
}
```

`\clozelinefil` The usage of the command `\clozelinefil` is described in detail in section (→ 2.2.13).

```
\let\clozelinefilplain=\clozelinefil
\let\clozelinefil=\undefined
\newcommand{\clozelinefil}[1][]{%
  \ClozeSetLocalOptions{#1}%
  \clozelinefilplain%
}
```

`\clozefil` The usage of the command `\clozefil` is described in detail in section (→ 2.2.5).

```
\let\clozefil=\undefined
\newcommand{\clozefil}[2][]{%
  \cloze[#1]{#2}\clozelinefil[#1]%
}
```

`\clozeextend` TODO: Use node library to create kern nodes.

```
\newcommand{\clozeextend}[1][1]{%
  \directlua{
    local loop = #1
    for variable = 1, loop do
      tex.print(' \string\\hspace{1em} \string\\strut')
    end
  }
}
```

`\ClozeTextColor`

```
\newcommand{\ClozeTextColor}[1]{%
  \textcolor%
    {\directlua{tex.print(cloze.get_value('textcolor_name'))}}%
    {#1}%
}
```

`\ClozeStrikeLine`

```
\newcommand\ClozeStrikeLine{%
  \bgroup%
  \markoverwith{%
```

```
    \ClozeTextColor{%
      \rule[0.5ex]{2pt}{1pt}%
    }%
  }%
  \ULon%
}
```

\clozestrike

```
\newcommand{\clozestrike}[3][]{%
  \ClozeSetLocalOptions{#1}%
  \ifclozeshow%
    \stackengine%
      {\Sstackgap}% \Sstackgap or \Lstackgap or \stackgap or stacklength
      {\ClozeStrikeLine{#2}}% anchor
      {\ClozeTextColor{\clozefont{}#3}}% item
      {O}% O or U
      {c}% \stackalignment or l or c or r
      {\quietstack}% \quietstack or T or F
      {T}% \useanchorwidth or T or F
      {\stacktype}% \stacktype or S or L
  \else%
    \stackengine%
      {\Sstackgap}% \Sstackgap or \Lstackgap or \stackgap or stacklength
      {#2}% anchor
      {\texttransparent{0}{\clozefont{}#3}}% item
      {O}% O or U
      {c}% \stackalignment or l or c or r
      {\quietstack}% \quietstack or T or F
      {T}% \useanchorwidth or T or F
      {\stacktype}% \stacktype or S or L
  \fi%
}
```

4.3 The file cloze.lua

```
--- Cloze uses [LDoc](https://github.com/stevedonovan/ldoc) for the
--  source code documentation. The supported tags are described on in
--  the [wiki](https://github.com/stevedonovan/LDoc/wiki).
--
-- <h3>Naming conventions</h3>
--
-- * _Variable_ names for _nodes_ are suffixed with `_node`, for example
--   `head_node`.
-- * _Variable_ names for _lengths_ (dimensions) are suffixed with
--   `_length`, for example `width`.
--
-- @module cloze

-- luacheck: globals node tex modules luatexbase callback

-- __cloze.lua__
```

```lua
-- __Initialisation of the function tables__

-- It is good form to provide some background informations about this Lua
-- module.
if not modules then modules = { } end modules ['cloze'] = {
  version   = '1.6',
  comment   = 'cloze',
  author    = 'Josef Friedrich, R.-M. Huber',
  copyright = 'Josef Friedrich, R.-M. Huber',
  license   = 'The LaTeX Project Public License Version 1.3c 2008-05-04'
}

--- `nodex` is a abbreviation for __node eXtended__.
local nodex = {}

--- All values and functions, which are related to the option management,
-- are stored in a table called `registry`.
local registry = {}

--- I didn't know what value I should take as `user_id`. Therefore I
-- took my birthday and transformed it to a large number.
registry.user_id = 3121978
registry.storage = {}
registry.defaults = {
  ['align'] = 'l',
  ['boxheight'] = false,
  ['boxwidth'] = '\\linewidth',
  ['distance'] = '1.5pt',
  ['hide'] = false,
  ['linecolor'] = '0 0 0 rg 0 0 0 RG', -- black
  ['linecolor_name'] = 'black',
  ['margin'] = '3pt',
  ['resetcolor'] = '0 0 0 rg 0 0 0 RG', -- black
  ['resetcolor_name'] = 'black',
  ['show_text'] = true,
  ['show'] = true,
  ['spacing'] = '1.6',
  ['textcolor'] = '0 0 1 rg 0 0 1 RG', -- blue
  ['textcolor_name'] = 'blue', -- blue
  ['thickness'] = '0.4pt',
  ['width'] = '2cm',
}
registry.global_options = {}
registry.local_options = {}

-- The `base` table contains some basic functions. `base` is the only
-- table of this Lua module that will be exported.
local base = {}
base.is_registered = {}

--- Node precessing (nodex)
-- @section nodex

-- All functions in this section are stored in a table called `nodex`.
-- `nodex` is a abbreviation for __node eXtended__. The `nodex` table
-- bundles all functions, which extend the built-in `node` library.
```

```
-- __Color handling (color)__

-- __create_colorstack__
-- Create a whatsit node of the subtype `pdf_colorstack`. `data` is a PDF
-- colorstack string like `0 0 0 rg 0 0 0 RG`.
function nodex.create_colorstack(data)
  if not data then
    data = '0 0 0 rg 0 0 0 RG' -- black
  end
  local whatsit = node.new('whatsit', 'pdf_colorstack')
  whatsit.stack = 0
  whatsit.data = data
  return whatsit
end

---
-- `nodex.create_color()` is a wrapper for the function
-- `nodex.create_colorstack()`. It queries the current values of the
-- options `linecolor` and `textcolor`. The argument `option` accepts the
-- strings `line`, `text` and `reset`.
function nodex.create_color(option)
  local data
  if option == 'line' then
    data = registry.get_value('linecolor')
  elseif option == 'text' then
    data = registry.get_value('textcolor')
  elseif option == 'reset' then
    data = nil
  else
    data = nil
  end
  return nodex.create_colorstack(data)
end

-- __Line handling (line)__

--- Create a rule node, which is used as a line for the cloze texts. The
-- `depth` and the `height` of the rule are calculated form the options
-- `thickness` and `distance`. The argument `width` must have the length
-- unit __scaled points__.
function nodex.create_line(width)
  local rule = node.new(node.id('rule'))
  local thickness = tex.sp(registry.get_value('thickness'))
  local distance = tex.sp(registry.get_value('distance'))
  rule.depth = distance + thickness
  rule.height = - distance
  rule.width = width
  return rule
end

--- Insert a `list` of nodes after or before the `current`. The `head`
-- argument is optional. In some edge cases it is unfortately necessary.
-- if `head` is omitted the `current` node is used. The argument
-- `position` can take the values `'after'` or `'before'`.
function nodex.insert_list(position, current, list, head_node)
  if not head_node then
```

```
    head_node = current
  end
  for _, insert in ipairs(list) do
    if position == 'after' then
      head_node, current = node.insert_after(head_node, current, insert)
    elseif position == 'before' then
      head_node, current = node.insert_before(head_node, current, insert)
    end
  end
  return current
end

--- Enclose a rule node (cloze line) with two PDF colorstack whatsits.
--  The first colorstack node dyes the line, the seccond resets the
--  color.
--
-- __Node list__
--
-- <table>
-- <thead>
--   <tr>
--     <th>`color_line_node`</th>
--     <th>`whatsit`</th>
--     <th>`pdf_colorstack`</th>
--     <th>Line color</th>
--   </tr>
-- </thead>
-- <tbody>
--   <tr>
--     <td>`line_node`</td>
--     <td>`rule`</td>
--     <td></td>
--     <td>`width`</td>
--   </tr>
--   <tr>
--     <td>`color_reset_node`</td>
--     <td>`whatsit`</td>
--     <td>`pdf_colorstack`</td>
--     <td>Reset color</td>
--   </tr>
-- </tbody>
-- </table>
function nodex.insert_line(current, width)
  return nodex.insert_list(
    'after',
    current,
    {
      nodex.create_color('line'),
      nodex.create_line(width),
      nodex.create_color('reset')
    }
  )
end

--- This function enclozes a rule node with color nodes as it the function
-- `nodex.insert_line` does. In contrast to `nodex.insert_line` the three
-- nodes are appended to \TeX's 'current list'. They are not inserted in
```

```
-- a node list, which is accessed by a Lua callback.
--
-- __Node list__
--
-- <table>
-- <thead>
--   <tr>
--     <th>-</th>
--     <th>`whatsit`</th>
--     <th>`pdf_colorstack`</th>
--     <th>Line color</th>
--   </tr>
-- </thead>
-- <tbody>
--   <tr>
--     <td>-</td>
--     <td>`rule`</td>
--     <td></td>
--     <td>`width`</td>
--   </tr>
--   <tr>
--     <td>-</td>
--     <td>`whatsit`</td>
--     <td>`pdf_colorstack`</td>
--     <td>Reset color</td>
--   </tr>
-- </tbody>
-- </table>
function nodex.write_line()
  node.write(nodex.create_color('line'))
  node.write(nodex.create_line(tex.sp(registry.get_value('width'))))
  node.write(nodex.create_color('reset'))
end

-- __Handling of extendable lines (linefil)__

--- This function creates a line which stretchs indefinitely in the
-- horizontal direction.
function nodex.create_linefil()
  local glue = node.new('glue')
  glue.subtype = 100
  glue.stretch = 65536
  glue.stretch_order = 3
  local rule = nodex.create_line(0)
  rule.dir = 'TLT'
  glue.leader = rule
  return glue
end

--- The function `nodex.write_linefil` surrounds a indefinitely strechable
-- line with color whatsits and puts it to \TeX's 'current (node) list'.
function nodex.write_linefil()
  node.write(nodex.create_color('line'))
  node.write(nodex.create_linefil())
  node.write(nodex.create_color('reset'))
end
```

```
-- __Kern handling (kern)__

--- This function creates a kern node with a given width. The argument
-- `width` had to be specified in scaled points.
local function create_kern_node(width)
  local kern_node = node.new(node.id('kern'))
  kern_node.kern = width
  return kern_node
end

--- Add at the beginning of each `hlist` node list a strut (a invisible
--  character).
--
-- Now we can add line, color etc. nodes after the first node of a hlist
-- not before - after is much more easier.
--
-- @tparam node hlist_node
--
-- @treturn node hlist_node
-- @treturn node strut_node
-- @treturn node prev_head_node
local function insert_strut_into_hlist(hlist_node)
  local prev_head_node = hlist_node.head
  local kern_node = create_kern_node(0)
  local strut_node = node.insert_before(hlist_node.head, prev_head_node, kern_node)
  hlist_node.head = prev_head_node.prev
  return hlist_node, strut_node, prev_head_node
end

--- Write kern nodes to the current node list. This kern nodes can be used
-- to build a margin.
function nodex.write_margin()
  local kern = create_kern_node(tex.sp(registry.get_value('margin')))
  node.write(kern)
end

--- Search for a `hlist` (subtype `line`) and nsert a strut node into
-- the list if a hlist is found.
--
-- @tparam node head_node The head of a node list.
--
-- @treturn node hlist_node
-- @treturn node strut_node
-- @treturn node prev_head_node
local function search_hlist(head_node)
  while head_node do
    if head_node.id == node.id('hlist') and head_node.subtype == 1 then
      return insert_strut_into_hlist(head_node)
    end
    head_node = head_node.next
  end
end

--- Option handling.
--
-- The table `registry` bundels functions that deal with option handling.
--
```

```
-- <h2>Marker processing (marker)</h2>
--
-- A marker is a whatsit node of the subtype `user_defined`. A marker has
-- two purposes:
--
-- * Mark the begin and the end of a gap.
-- * Store a index number, that points to a Lua table, which holds
--   some additional data like the local options.
-- @section registry

--- We create a user defined whatsit node that can store a number (type
--  = 100).
--
-- In order to distinguish this node from other user defined whatsit
-- nodes we set the `user_id` to a large number. We call this whatsit
-- node a marker. The argument `index` is a number, which is associated
-- to values in the `registry.storage` table.
function registry.create_marker(index)
  local marker = node.new('whatsit','user_defined')
  marker.type = 100 -- number
  marker.user_id = registry.user_id
  marker.value = index
  return marker
end

--- Write a marker node to TeX's current node list.
--
-- The argument `mode` accepts the string values `basic`, `fix` and
-- `par`. The argument `position`. The argument `position` is either set
-- to `start` or to `stop`.
function registry.write_marker(mode, position)
  local index = registry.set_storage(mode, position)
  local marker = registry.create_marker(index)
  node.write(marker)
end

--- This functions checks if the given node `item` is a marker.
function registry.is_marker(item)
  if item.id == node.id('whatsit')
    and item.subtype == node.subtype('user_defined')
    and item.user_id == registry.user_id then
    return true
  else
    return false
  end
end

--- This functions tests, whether the given node `item` is a marker.
--
-- The argument `item` is a node. The argument `mode` accepts the string
-- values `basic`, `fix` and `par`. The argument `position` is either
-- set to `start` or to `stop`.
function registry.check_marker(item, mode, position)
  local data = registry.get_marker_data(item)
  if data and data.mode == mode and data.position == position then
    return true
  else
```

```
    return false
  end
end

--- `registry.get_marker` returns the given marker.
--
-- The argument `item` is a node. The argument `mode` accepts the string
-- values `basic`, `fix` and `par`. The argument `position` is either
-- set to `start` or to `stop`.
function registry.get_marker(item, mode, position)
  local out
  if registry.check_marker(item, mode, position) then
    out = item
  else
    out = false
  end
  if out and position == 'start' then
    registry.get_marker_values(item)
  end
  return out
end

--- `registry.get_marker_data` tests whether the node `item` is a
--  marker.
--
-- The argument `item` is a node of unspecified type.
function registry.get_marker_data(item)
  if item.id == node.id('whatsit')
    and item.subtype == node.subtype('user_defined')
    and item.user_id == registry.user_id then
    return registry.get_storage(item.value)
  else
    return false
  end
end

--- First this function saves the associatied values of a marker to the
-- local options table. Second it returns this values. The argument
-- `marker` is a whatsit node.
function registry.get_marker_values(marker)
  local data = registry.get_marker_data(marker)
  registry.local_options = data.values
  return data.values
end

--- This function removes a given whatsit marker.
--
-- It only deletes a node, if a marker is given.
--
-- @treturn node head
-- @treturn node current
function registry.remove_marker(marker)
  if registry.is_marker(marker) then
    return node.remove(marker, marker)
  end
end
```

```lua
-- __Storage functions (storage)__

--- `registry.index` is a counter. The functions `registry.get_index()`
-- increases the counter by one and then returns it.
function registry.get_index()
  if not registry.index then
    registry.index = 0
  end
  registry.index = registry.index + 1
  return registry.index
end

--- `registry.set_storage()` stores the local options in the Lua table
--  `registry.storage`.
--
-- It returns a numeric index number. This index number is the key,
-- where the local options in the Lua table are stored. The argument
-- `mode` accepts the string values `basic`, `fix` and `par`.
function registry.set_storage(mode, position)
  local index = registry.get_index()
  local data = {
    ['mode'] = mode,
    ['position'] = position
  }
  data.values = registry.local_options
  registry.storage[index] = data
  return index
end

--- The function `registry.get_storage()` retrieves values which belong
--  to a whatsit marker.
--
-- The argument `index` is a numeric value.
function registry.get_storage(index)
  return registry.storage[index]
end

-- __Option processing (option)__

--- This function stores a value `value` and his associated key `key`
--  either to the global (`registry.global_options`) or to the local
--  (`registry.local_options`) option table.
--
-- The global boolean variable `registry.local_options` controls in
-- which table the values are stored.
function registry.set_option(key, value)
  if value == '' or value == '\\color@ ' then
    return false
  end
  if registry.is_global == true then
    registry.global_options[key] = value
  else
    registry.local_options[key] = value
  end
end

--- `registry.set_is_global()` sets the variable `registry.is_global` to
```

```
-- the value `value`. It is intended, that the variable takes boolean
-- values.
function registry.set_is_global(value)
  registry.is_global = value
end

--- This function unsets the local options.
function registry.unset_local_options()
  registry.local_options = {}
end

--- `registry.unset_global_options` empties the global options storage.
function registry.unset_global_options()
  registry.global_options = {}
end

--- Retrieve a value from a given key. First search for the value in the
-- local options, then in the global options. If both option storages are
-- empty, the default value will be returned.
function registry.get_value(key)
  if registry.has_value(registry.local_options[key]) then
    return registry.local_options[key]
  end
  if registry.has_value(registry.global_options[key]) then
    return registry.global_options[key]
  end
  return registry.defaults[key]
end


--- The function `registry.get_value_show()` returns the boolean value
-- `true` if the option `show` is true. In contrast to the function
-- `registry.get_value()` it converts the string value `true' to a
-- boolean value.
function registry.get_value_show()
  if
    registry.get_value('show') == true
  or
    registry.get_value('show') == 'true'
  then
    return true
  else
    return false
  end
end

--- This function tests whether the value `value` is not empty and has a
-- value.
function registry.has_value(value)
  if value == nil or value == '' or value == '\\color@ ' then
    return false
  else
    return true
  end
end

--- `registry.get_defaults(option)` returns a the default value of the
```

```
-- given option.
function registry.get_defaults(option)
  return registry.defaults[option]
end

--- Assembly to cloze texts.
-- @section cloze_functions

--- Assemble a possibly muliline cloze.
--
-- The corresponding LaTeX command to this Lua function is `\cloze`.
--  This function is used by other cloze TeX macros too: `\clozenol`,
-- `\clozefil`
--
-- @tparam node head_node_input The head of a node list.
--
-- @treturn node The head of the node list.
local function make_basic(head_node_input)
  -- This local variables are overloaded by function who
  -- call each other.
  local continue_cloze, search_stop

  --- The function `make_single()` makes one gap. The argument
  --  `start_node` is the node where the gap begins. The argument
  --  `stop_node` is the node where the gap ends.
  --
  -- @tparam node start_node The node to start / begin a new cloze.
  -- @tparam node stop_node The node to stop / end a new cloze.
  -- @tparam node parent_node The parent node (hlist) of the start and
  --   the stop node.
  --
  -- @treturn node stop_node The stop node.
  -- @treturn parent_node The parent node (hlist) of the stop node.
  local function make_single(start_node, stop_node, parent_node)
    local node_head = start_node
    local line_width = node.dimensions(
      parent_node.glue_set,
      parent_node.glue_sign,
      parent_node.glue_order,
      start_node,
      stop_node
    )
    local line_node = nodex.insert_line(start_node, line_width)
    local color_text_node = nodex.insert_list('after', line_node,
    ↪  {nodex.create_color('text')})
    if registry.get_value_show() then
      nodex.insert_list('after', color_text_node, {create_kern_node(-line_width)})
      nodex.insert_list('before', stop_node, {nodex.create_color('reset')},
      ↪  node_head)
    else
      line_node.next = stop_node.next
      stop_node.prev = line_node -- not line_node.prev -> line color leaks out
    end
    -- In some edge cases the lua callbacks get fired up twice. After the
    -- cloze has been created, the start and stop whatsit markers can be
    -- deleted.
    registry.remove_marker(start_node)
```

```
  return registry.remove_marker(stop_node), parent_node
end

--- Search for a stop marker or make a cloze up to the end of the node
-- list.
--
-- @tparam node start_node The node to start a new cloze.
-- @tparam node parent_node The parent node (hlist) of the start node.
--
-- @treturn head_node The fast forwarded new head of the node list.
-- @treturn parent_node The parent node (hlist) of the head node.
function search_stop(start_node, parent_node)
  local head_node = start_node
  local last_node
  while head_node do
    if registry.check_marker(head_node, 'basic', 'stop') then
      return make_single(start_node, head_node, parent_node)
    end
    last_node = head_node
    head_node = head_node.next
  end
  -- Make a cloze until the end of the node list.
  head_node = make_single(start_node, last_node, parent_node)
  if parent_node.next then
    return continue_cloze(parent_node.next)
  else
    return head_node, parent_node
  end
end

--- Continue a multiline cloze.
--
-- @tparam node parent_node A parent node to search for a hlist node.
--
-- @treturn head_node The fast forwarded new head of the node list.
-- @treturn parent_node The parent node (hlist) of the head node.
function continue_cloze(parent_node)
  local hlist_node = search_hlist(parent_node)
  if hlist_node then
    local start_node = hlist_node.head
    return search_stop(start_node, hlist_node)
  end
end

--- Search for a start marker.
--
-- @tparam node head_node The head of a node list.
-- @tparam node parent_node The parent node (hlist) of the head node.
local function search_start(head_node, parent_node)
  while head_node do
    if head_node.head then
      search_start(head_node.head, head_node)
    elseif registry.check_marker(head_node, 'basic', 'start') and
           parent_node and
           parent_node.id == node.id('hlist') then
      -- Adds also a strut at the first position. It prepars the
      -- hlist and makes it ready to build a cloze.
```

```
        search_hlist(parent_node)
        head_node, parent_node = search_stop(head_node, parent_node)
      end
      if head_node then
        head_node = head_node.next
      else
        break
      end
    end
  end

  search_start(head_node_input)
  return head_node_input
end

--- The corresponding LaTeX command to this Lua function is `\clozefix`.
--
-- @tparam node head_node_input The head of a node list.
local function make_fix(head_node_input)

  --- Calculate the length of the whitespace before (`kern_start_length`) and
  -- after (`kern_stop_length`) the text.
  local function calculate_length(start, stop)
    local width, kern_start_length, kern_stop_length, text_width, half_length,
    ↪  align
    width = tex.sp(registry.get_value('width'))
    text_width = node.dimensions(start, stop)
    align = registry.get_value('align')
    if align == 'right' then
      kern_start_length = - text_width
      kern_stop_length = 0
    elseif align == 'center' then
      half_length = (width - text_width) / 2
      kern_start_length = - half_length - text_width
      kern_stop_length = half_length
    else
      kern_start_length = - width
      kern_stop_length = width - text_width
    end
    return width, kern_start_length, kern_stop_length
  end

  --- The function `make_single` generates a gap of fixed width.
  --
  -- __Node lists__
  --
  -- __Show text:__
  --
  -- <table>
  -- <tbody>
  --   <tr>
  --     <td>`start_node`</td>
  --     <td>`whatsit`</td>
  --     <td>`user_definded`</td>
  --     <td>`index`</td>
  --   </tr>
  --   <tr>
```

```
--     <td>`line_node`</td>
--     <td>`rule`</td>
--     <td></td>
--     <td>`width`</td>
--   </tr>
--   <tr>
--     <td>`kern_start_node`</td>
--     <td>`kern`</td>
--     <td>&amp;amp; Depends on `align`</td>
--     <td></td>
--   </tr>
--   <tr>
--     <td>`color_text_node`</td>
--     <td>`whatsit`</td>
--     <td>`pdf_colorstack`</td>
--     <td>Text color</td>
--   </tr>
--   <tr>
--     <td></td>
--     <td>`glyphs`</td>
--     <td>&amp;amp; Text to show</td>
--     <td></td>
--   </tr>
--   <tr>
--     <td>`color_reset_node`</td>
--     <td>`whatsit`</td>
--     <td>`pdf_colorstack`</td>
--     <td>Reset color</td>
--   </tr>
--   <tr>
--     <td>`kern_stop_node`</td>
--     <td>`kern`</td>
--     <td>&amp;amp; Depends on `align`</td>
--     <td></td>
--   </tr>
--   <tr>
--     <td>`stop_node`</td>
--     <td>`whatsit`</td>
--     <td>`user_definded`</td>
--     <td>`index`</td>
--   </tr>
-- </tbody>
-- </table>
--
-- __Hide text:__
--
-- <table>
-- <thead>
--   <tr>
--     <th>`start_node`</th>
--     <th>`whatsit`</th>
--     <th>`user_definded`</th>
--     <th>`index`</th>
--   </tr>
-- </thead>
-- <tbody>
--   <tr>
```

```
--     <td>`line_node`</td>
--     <td>`rule`</td>
--     <td></td>
--     <td>`width`</td>
--   </tr>
--   <tr>
--     <td>`stop_node`</td>
--     <td>`whatsit`</td>
--     <td>`user_definded`</td>
--     <td>`index`</td>
--   </tr>
-- </tbody>
-- </table>
--
-- Make fixed size cloze.
--
-- @param start The node, where the gap begins
-- @param stop The node, where the gap ends
local function make_single(start, stop)
  local width, kern_start_length, kern_stop_length, line_node
  width, kern_start_length, kern_stop_length = calculate_length(start, stop)
  line_node = nodex.insert_line(start, width)
  if registry.get_value_show() then
    nodex.insert_list(
      'after',
      line_node,
      {
        create_kern_node(kern_start_length),
        nodex.create_color('text')
      }
    )
    nodex.insert_list(
      'before',
      stop,
      {
        nodex.create_color('reset'),
        create_kern_node(kern_stop_length)
      },
      start
    )
  else
    line_node.next = stop.next
  end
  registry.remove_marker(start)
  registry.remove_marker(stop)
end

--- Function to recurse the node list and search after marker.
--
-- @tparam node head_node The head of a node list.
local function make_fix_recursion(head_node)
  local start_node, stop_node = false, false
  while head_node do
    if head_node.head then
      make_fix_recursion(head_node.head)
    else
      if not start_node then
```

```
          start_node = registry.get_marker(head_node, 'fix', 'start')
        end
        if not stop_node then
          stop_node = registry.get_marker(head_node, 'fix', 'stop')
        end
        if start_node and stop_node then
          make_single(start_node, stop_node)
          start_node, stop_node = false, false
        end
      end
      head_node = head_node.next
    end
  end

  make_fix_recursion(head_node_input)
  return head_node_input
end

--- The corresponding LaTeX environment to this lua function is
-- `clozepar`.
--
-- __Node lists__
--
-- __Show text:__
--
-- <table>
-- <thead>
--   <tr>
--     <th>`strut_node`</th>
--     <th>`kern`</th>
--     <th></th>
--     <th>width = 0</th>
--   </tr>
-- </thead>
-- <tbody>
--   <tr>
--     <td>`line_node`</td>
--     <td>`rule`</td>
--     <td></td>
--     <td>`width` (Width from hlist)</td>
--   </tr>
--   <tr>
--     <td>`kern_node`</td>
--     <td>`kern`</td>
--     <td></td>
--     <td>`-width`</td>
--   </tr>
--   <tr>
--     <td>`color_text_node`</td>
--     <td>`whatsit`</td>
--     <td>`pdf_colorstack`</td>
--     <td>Text color</td>
--   </tr>
--   <tr>
--     <td></td>
--     <td>`glyphs`</td>
--     <td></td>
```

```
--     <td>Text to show</td>
--   </tr>
--   <tr>
--     <td>`tail_node`</td>
--     <td>`glyph`</td>
--     <td></td>
--     <td>Last glyph in hlist</td>
--   </tr>
--   <tr>
--     <td>`color_reset_node`</td>
--     <td>`whatsit`</td>
--     <td>`pdf_colorstack`</td>
--     <td>Reset color</td>
--   </tr>
-- </tbody>
-- </table>
--
-- __Hide text:__
--
-- <table>
-- <thead>
--   <tr>
--     <th>`strut_node`</th>
--     <th>`kern`</th>
--     <th></th>
--     <th>width = 0</th>
--   </tr>
-- </thead>
-- <tbody>
--   <tr>
--     <td>`line_node`</td>
--     <td>`rule`</td>
--     <td></td>
--     <td>`width` (Width from hlist)</td>
--   </tr>
-- </tbody>
-- </table>
--
-- @tparam node head_node The head of a node list.
local function make_par(head_node)
  local strut_node, line_node, width
  for hlist_node in node.traverse_id(node.id('hlist'), head_node) do
    for whatsit in node.traverse_id(node.id('whatsit'), hlist_node.head) do
      registry.get_marker(whatsit, 'par', 'start')
    end
    width = hlist_node.width
    hlist_node, strut_node, _ = insert_strut_into_hlist(hlist_node)
    line_node = nodex.insert_line(strut_node, width)
    if registry.get_value_show() then
      nodex.insert_list(
        'after',
        line_node,
        {
          create_kern_node(-width),
          nodex.create_color('text')
        }
      )
```

```
      nodex.insert_list(
        'after',
        node.tail(head_node),
        {nodex.create_color('reset')}
      )
    else
      line_node.next = nil
    end
  end
  return head_node
end

---
-- @tparam string callback_name The name of a callback
-- @tparam function func A function to register for the callback
-- @tparam string description Only used in LuaLatex
local function register_callback(callback_name, func, description)
  if luatexbase then
    luatexbase.add_to_callback(
      callback_name,
      func,
      description
    )
  else
    callback.register(callback_name, func)
  end
end

---
-- @tparam string callback_name The name of a callback
-- @tparam string description Only used in LuaLatex
local function unregister_callback(callback_name, description)
  if luatexbase then
    luatexbase.remove_from_callback(
      callback_name,
      description
    )
  else
    callback.register(callback_name, nil)
  end
end

--- Basic module functions.
-- The `base` table contains functions which are published to the
-- `cloze.sty` file.
-- @section base

--- This function registers the functions `make_par`, `make_basic` and
--  `make_fix` the Lua callbacks.
--
-- `make_par` and `make_basic` are registered to the callback
-- `post_linebreak_filter` and `make_fix` to the callback
-- `pre_linebreak_filter`. The argument `mode` accepts the string values
-- `basic`, `fix` and `par`. A special treatment is needed for clozes in
-- display math mode. The `post_linebreak_filter` is not called on
-- display math formulas. I'm not sure if the `pre_output_filter` is the
-- right choice to capture the display math formulas.
```

```
function base.register(mode)
  if mode == 'par' then
    register_callback(
      'post_linebreak_filter',
      make_par,
      mode
    )
    return true
  end
  if not base.is_registered[mode] then
    if mode == 'basic' then
      register_callback(
        'post_linebreak_filter',
        make_basic,
        mode
      )
      register_callback(
        'pre_output_filter',
        make_basic,
        mode
      )
    elseif mode == 'fix' then
      register_callback(
        'pre_linebreak_filter',
        make_fix,
        mode
      )
    else
      return false
    end
    base.is_registered[mode] = true
  end
end

--- `base.unregister(mode)` deletes the registered functions from the
-- Lua callbacks.
--
-- @tparam string mode The argument `mode` accepts the string values
-- `basic`, `fix` and `par`.
function base.unregister(mode)
  if mode == 'basic' then
    unregister_callback('post_linebreak_filter', mode)
    unregister_callback('pre_output_filter', mode)
  elseif mode == 'fix' then
    unregister_callback('pre_linebreak_filter', mode)
  else
    unregister_callback('post_linebreak_filter', mode)
  end
end

-- Publish some functions to the `cloze.sty` file.
base.linefil = nodex.write_linefil
base.line = nodex.write_line
base.margin = nodex.write_margin
base.set_option = registry.set_option
base.set_is_global = registry.set_is_global
base.unset_local_options = registry.unset_local_options
```

```
base.reset = registry.unset_global_options
base.get_defaults = registry.get_defaults
base.get_value = registry.get_value
base.marker = registry.write_marker

return base
```

Change History

Index

Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.