The LaTeX3 kernel: coffins[*]

The LaTeX3 Project[†]

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Abstract

A LaTeX3 'coffin' is a design-level method for typesetting boxed material. The structure of coffins contains not only the boxed material itself but also information about the size of the box and potential alignment positions. This structure makes it is possible to build complex layouts rapidly by assembling coffins. The code here provides the low-level support system for coffins.

Contents

1 Introduction

The material in this module provides the low-level support system for coffins. For details about the design concept of a coffin, see the xcoffins module.

[*] This file describes v2109, last revised 2010/12/23.

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2 Code-level functions

`\coffin_new:N` `\coffin_new:N` ⟨*coffin*⟩

Creates a new ⟨*coffin*⟩ or raises an error if the name is already taken. The declaration is global. The ⟨*coffin*⟩ will initially be empty.

`\coffin_clear:N` `\coffin_clear:N` ⟨*coffin*⟩

Clears the content of the ⟨*coffin*⟩ within the current TEX group level.

`\coffin_set_eq:NN` `\coffin_set_eq:NN` ⟨*coffin1*⟩ ⟨*coffin2*⟩

Sets both the content and poles of ⟨*coffin1*⟩ equal to those of ⟨*coffin2*⟩ within the current TEX group level.

`\hcoffin_set:Nn` `\hcoffin_set:Nn` ⟨*coffin*⟩ `{`⟨*material*⟩`}`

Typesets the ⟨*material*⟩ in horizontal mode, storing the result in the ⟨*coffin*⟩. The standard poles for the ⟨*coffin*⟩ are then set up based on the size of the typeset material.

`\vcoffin_set:Nnn` `\vcoffin_set:Nnn` ⟨*coffin*⟩ `{`⟨*width*⟩`}` `{`⟨*material*⟩`}`

Typesets the ⟨*material*⟩ in vertical mode constrained to the given ⟨*width*⟩ and stores the result in the ⟨*coffin*⟩. The standard poles for the ⟨*coffin*⟩ are then set up based on the size of the typeset material.

`\coffin_set_horizontal_pole:Nnn` `\coffin_set_horizontal_pole:Nnn` ⟨*coffin*⟩
`{`⟨*pole*⟩`}` `{`⟨*offset*⟩`}`

Sets the ⟨*pole*⟩ to run horizontally through the ⟨*coffin*⟩. The ⟨*pole*⟩ will be located at the ⟨*offset*⟩ from the bottom edge of the bounding box of the ⟨*coffin*⟩. The ⟨*offset*⟩ should be given as a dimension expression; this may include the terms csTotalHeight, `\Height`, `\Depth` and `\Width`, which will evaluate to the appropriate dimensions of the ⟨*coffin*⟩.

`\coffin_set_vertical_pole:Nnn` `\coffin_set_vertical_pole:Nnn` ⟨*coffin*⟩
`{`⟨*pole*⟩`}` `{`⟨*offset*⟩`}`

Sets the ⟨*pole*⟩ to run vertically through the ⟨*coffin*⟩. The ⟨*pole*⟩ will be located at the ⟨*offset*⟩ from the left-hand edge of the bounding box of the ⟨*coffin*⟩. The ⟨*offset*⟩ should be given as a dimension expression; this may include the terms `\TotalHeight`, `\Height`, `\Depth` and `\Width`, which will evaluate to the appropriate dimensions of the ⟨*coffin*⟩.

`\coffin_rotate:Nn` `\coffin_rotate:Nn` ⟨*coffin*⟩ `{`⟨*angle*⟩`}`

Rotates the ⟨*coffin*⟩ by the given ⟨*angle*⟩ (given in degrees counter-clockwise). This process will rotate both the coffin content and poles. Multiple rotations will not result in the bounding box of the coffin growing unnecessarily.

`\coffin_attach:NnnNnnnn`

`\coffin_attach:NnnNnnnn`
⟨*coffin1*⟩ `{`⟨*coffin*$_1$*-pole*$_1$⟩`}` `{`⟨*coffin*$_1$*-pole*$_2$⟩`}`
⟨*coffin2*⟩ `{`⟨*coffin*$_2$*-pole*$_1$⟩`}` `{`⟨*coffin*$_2$*-pole*$_2$⟩`}`
`{`⟨*x-offset*⟩`}` `{`⟨*y-offset*⟩`}`

This function carries out alignment such that the bounding box of ⟨*coffin1*⟩ is not altered, *i.e.* ⟨*coffin2*⟩ can protrude outside of the bounding box of the coffin. The alignment is carried out by first calculating ⟨*handle1*⟩, the point of intersection of ⟨*coffin1-pole1*⟩ and ⟨*coffin1-pole2*⟩, and ⟨*handle2*⟩, the point of intersection of ⟨*coffin2-pole1*⟩ and ⟨*coffin2-pole2*⟩. ⟨*coffin2*⟩ is then attached to ⟨*coffin1*⟩ such that the relationship between ⟨*handle1*⟩ and ⟨*handle2*⟩ is described by the ⟨*x-offset*⟩ and ⟨*y-offset*⟩. The two offsets should be given as dimension expressions.

`\coffin_join:NnnNnnnn`

`\coffin_join:NnnNnnnn`
⟨*coffin1*⟩ `{`⟨*coffin*$_1$*-pole*$_1$⟩`}` `{`⟨*coffin*$_1$*-pole*$_2$⟩`}`
⟨*coffin2*⟩ `{`⟨*coffin*$_2$*-pole*$_1$⟩`}` `{`⟨*coffin*$_2$*-pole*$_2$⟩`}`
`{`⟨*x-offset*⟩`}` `{`⟨*y-offset*⟩`}`

This function carries out alignment such that the bounding box of ⟨*coffin1*⟩ after the process will expand. The new bounding box will cover the area contain the bounding boxes of the two original coffins. The alignment is carried out by first calculating ⟨*handle1*⟩, the point of intersection of ⟨*coffin1-pole1*⟩ and ⟨*coffin1-pole2*⟩, and ⟨*handle2*⟩, the point of intersection of ⟨*coffin2-pole1*⟩ and ⟨*coffin2-pole2*⟩. ⟨*coffin2*⟩ is then attached to ⟨*coffin1*⟩ such that the relationship between ⟨*handle1*⟩ and ⟨*handle2*⟩ is described by the ⟨*x-offset*⟩ and ⟨*y-offset*⟩. The two offsets should be given as dimension expressions.

`\coffin_typeset:Nnnnn`

`\coffin_typeset:Nnnnn` ⟨*coffin*⟩ `{`⟨*pole*$_1$⟩`}` `{`⟨*pole*$_2$⟩`}`
`{`⟨*x-offset*⟩`}` `{`⟨*y-offset*⟩`}`

Typesetting is carried out by first calculating ⟨*handle*⟩, the point of intersection of ⟨*pole1*⟩ and ⟨*pole2*⟩. The coffin is then typeset such that the relationship between the current reference point in the document and the ⟨*handle*⟩ is described by the ⟨*x-offset*⟩ and ⟨*y-offset*⟩. The two offsets should be given as dimension expressions. Typesetting a coffin is therefore analogous to carrying out an alignment where the 'parent' coffin is the current insertion point.

`\coffin_display_handles:Nn` `\coffin_display_handles:Nn` ⟨*coffin*⟩ `{`⟨*colour*⟩`}`

This function first calculates the intersections between all of the ⟨*poles*⟩ of the ⟨*coffin*⟩ to give a set of ⟨*handles*⟩. It then prints the ⟨*coffin*⟩ at the current location in the source, with the position of the ⟨*handles*⟩ marked on the coffin. The ⟨*handles*⟩ will be labelled as part of this process: the locations of the ⟨*handles*⟩ and the labels are both printed in the ⟨*colour*⟩ specified.

\coffin_mark_handle:Nnnn

\coffin_mark_handle:Nnnn ⟨*coffin*⟩ {⟨*pole*$_1$⟩} {⟨*pole*$_2$⟩}
{⟨*colour*⟩}

This function first calculates the ⟨*handle*⟩ for the ⟨*coffin*⟩ as defined by the intersection of ⟨*pole1*⟩ and ⟨*pole2*⟩. It then marks the position of the ⟨*handle*⟩ on the ⟨*coffin*⟩. The ⟨*handle*⟩ will be labelled as part of this process: the location of the ⟨*handle*⟩ and the label are both printed in the ⟨*colour*⟩ specified.

\coffin_show_structure:N

\coffin_show_structure:N ⟨*coffin*⟩

This function shows the structural information about the ⟨*coffin*⟩ in the terminal. The width, height and depth of the typeset material are given, along with the location of all of the poles of the coffin.

Notice that the poles of a coffin are defined by four values: the x and y co-ordinates of a point that the pole passes through and the x- and y-components of a vector denoting the direction of the pole. It is the ratio between the later, rather than the absolute values, which determines the direction of the pole.

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