The `coloredtheorem` package (v1.0.4)

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1 Introduction

The `coloredtheorem` package is a simple environment that allows to write stuff inside boxes from `tcolorbox`. If necessary the boxes gracefully overflow to the next page. This package takes no options and includes `tcolorbox` if necessary. You may include `tcolorbox` with your own favourite options prior to including this package.

Akin to `\newtheorem` from the `amsmath` package, the user should start by defining a new *theorem/box* group and customize its aspect. Each new environment will have its own counter/numbering. Notice that `\label{...}` and `\ref{...}` work as expected. There is also a command to generate the corresponding *list of ...*

2 Usage

- `\usepackage{coloredtheorem}`

  – Load the `coloredtheorem` package. This package will load `tcolorbox` if necessary.

- `\cthnewtheorem{<envname>}{<Name>}[<tcolorbox options>]`

  – Create a new boxed *algorithm-like* environment.
    * `<envname>` is the suffix for the new environment being defined, e.g., `algoritm`. The effective environment name will be `cth<envname>`, e.g., `cthalgorithm`.
    * `<Name>` is the (printable) name or the new environment being defined, e.g., *Algorithm*.
    * `<tcolorbox options>` default options for the environment being defined (this argument is optional). These options are passed straight to the `tcolorbox` environment, so anything valid for `tcolorbox` is also valid here.

- `\begin{ctb<envname>}[<AltCaption>]{<Caption>}[<tcolorbox options>]`
  `<Contents>`
  `\end{ctb<envname>}`

- Create a new *algorithm-like* box with the given contents.
  * `<AltCaption>` is the alternative caption for the `\cthlistof<envname>s` (see below).
  * `<envname>` is the suffix for environment name, e.g., `algorithm`.
  * `<Caption>` is the caption/title of the box. If the caption is left empty, this box will not be listed with the `\cthlistof<envname>s` (see below).
  * `<tcolorbox options>` options to be passed to the `tcolorbox` environment, which will override the defaults given in `\cthnewalgorithm` (this argument is optional).
  * `<Contents>` the contents to by typeset inside the colored environment.

- `\cthlistof<envname>s`

  - `<envname>` is the environment name suffix, e.g., `\cthlistofalgorithms`. Please notice that there is a 's' (plural) after `<envname>`.

3 Example

Let's start by creating two new environments, one for *algorithms* and another for *examples*, both defaulting to a gray frame, the former with a yellowish background and the latter with a lighter gray background.

```
\cthnewtheorem{algorithm}{Algorithm}[coltitle=black, colback=yellow!10,
                                     colframe=black!15]
\cthnewtheorem{example}{Example}[coltitle=black, colback=black!5,
                                 colframe=black!30]
```

Anf this is a thought!

> **Though 1** This is a tought
>
> Let us suppose that the noumena have nothing to do with necessity, since knowledge of the Categories is a posteriori. Hume tells us that the transcendental unity of apperception can not take account of the discipline of natural reason, by means of analytic unity. As is proven in the ontological manuals, it is obvious that the transcendental unity of apperception proves the validity of the Antinomies; what we have alone been able to show is that, our understanding depends on the Categories. It remains a mystery why the Ideal stands in need of reason. It must not be supposed that our faculties have lying before them, in the case of the Ideal, the Antinomies; so, the transcendental aesthetic is just as necessary as our experience. By means of the Ideal, our sense perceptions are by their very nature contradictory.

The box with Algorithm 1, which uses the default visual that was given when creating the environment with `\cthnewtheorem` and gracefully overflows onto the next page, was created with:

```
\begin{cthalgorithm}{Advance a counter to the next value in a domain
                     $\omega \in \mathbb{N}$.}
  Algorithm body here!
\end{cthalgorithm}
```

Algorithm 1 Advance a counter to the next value in a domain $\omega \in \mathbb{N}$.

Input: α: The current value; and ω: the domain.
Output: The next value of α within the domain ω.
1: ▷ *e.g.,* $\alpha = 3$ & $\omega = \{8, 3, 2, 21, 5, 1\} \rightarrow 5$

2: **function** ADVANCE(α: int, ω: set) $\rightarrow$ int **is**
3:     $\alpha \leftarrow \alpha + 1$ ▷ *try the next value*
4:     **while** $\alpha \notin \omega$ & $\omega \neq \{\}$ **do**   ▷ *if this value is not in the domain*
5:     │ $\alpha \leftarrow \alpha + 1$ ▷ *try the next value*
6:     **end while**
7:     **if** $\omega \neq \{\}$ **then**
8:     │ $\omega \leftarrow \omega \setminus \{\alpha\}$ ▷ *remove the value from the domain*
9:     **end if**
10:    **return** α ▷ *the next value (or the last value plus one if no more values)*
11: **end function**

The box Example 1, which uses the default visual for the environment (as given to `\cthnewtheorem`...), was created with:

```
\begin{cthexample}{This is an example!}
  Example body here!
\end{cthexample}
```

Example 1 This is an example!

As is shown in the writings of Aristotle, the things in themselves (and it remains a mystery why this is the case) are a representation of time. Our concepts have lying before them the paralogisms of natural reason, but our a posteriori concepts have lying before them the practical emploument of our experience.

Now, let's create a new box for Algorithm 1, but with a different customized visual, which will affect only this entry! Notice that the customization argument is passed straight to the `tcolorbox` environment, so anything valid for `tcolorbox` is also valid here. Algorithm 2 was created with the following code:

```
\begin{cthalgorithm}
        {Advance a counter to the next value in a domain $\omega \in
            \mathbb{N}$, but now with a customized visual. Also, notice
            that this algorithm breaks the page boundaries.}
        [coltitle=white, colback=green!10, colframe=green!70!black,
            colbacktitle=\sffamily\bfseries\large, fonttitle=red!50!white]
  Algorithm body here!
\end{cthalgorithm}
```

Algorithm 2 Advance a counter to the next value in a domain $\omega \in \mathbb{N}$, but now with a customized visual. Notice that this algorithm also breaks the page boundaries.

> **Input:** α: The current value; and ω: the domain.
> **Output:** The next value of α within the domain ω.
> 1: $\triangleright$ *e.g., $\alpha = 3$ & $\omega = \{8, 3, 2, 21, 5, 1\} \to 5$*
>
> 2: **function** ADVANCE(α: int, ω: set) $\to$ int **is**
> 3: $\alpha \leftarrow \alpha + 1$ $\triangleright$ *try the next value*
> 4:   **while** $\alpha \notin \omega$ & $\omega \neq \{\,\}$ **do** $\triangleright$ *if this value is not in the domain*
> 5: | $\alpha \leftarrow \alpha + 1$ $\triangleright$ *try the next value*
> 6:   **end while**
> 7:   **if** $\omega \neq \{\,\}$ **then**
> 8: | $\omega \leftarrow \omega \setminus \{\alpha\}$ $\triangleright$ *remove the value from the domain*
> 9:   **end if**
> 10:   **return** α $\triangleright$ *the next value (or the last value plus one if no more values)*
> 11: **end function**

And now an example with no caption and a different visual... this example will not go into the `\listofexamples` below!

> **Example**
>
> *As we have already seen, what we have alone been able to show is that the objects in space and time would be falsified; what we have alone been able to show is that, our judgements are what first give rise to metaphysics. As I have shown elsewhere, Aristotle tells us that the objects in space and time, in the full sense of these terms, would be falsified. Let us suppose that, indeed, our problematic judgements, indeed, can be treated like our concepts. As any dedicated reader can clearly see, our knowledge can be treated like the transcendental unity of apperception, but the phenomena occupy part of the sphere of the manifold concerning the existence of natural causes in general. Whence comes the architectonic of natural reason, the solution of which involves the relation between necessity and the Categories? Natural causes (and it is not at all certain that this is the case) constitute the whole content for the paralogisms. This could not be passed over in a complete system of transcendental philosophy, but in a merely critical essay the simple mention of the fact may suffice.*

Now let's print the lists of algorithms and examples. Remember to add the prefix `cth` to the `listof`, i.e., `\cthlistofalgorithms` and `\cthlistofexamples`!

List of Algorithms

List of Examples