

# crumbs: L<sup>A</sup>T<sub>E</sub>X Package for Navigation Crumbs\*

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## 1 Introduction

`\crumbs` This package facilitates the addition of navigation crumbs to a document, a feature  
`\subcrumbs` particularly valuable in presentations and slide decks:

```
\documentclass{article}
\usepackage{crumbs}
\usepackage{fancyhdr}
\fancyhf{}
\pagestyle{fancy}
\fancyhead[L]{\crumbs / \subcrumbs}
\begin{document}
\section{Introduction}
Some text here.
\section{Related Works}
Some other text here.
\end{document}
```

`\crumb` The `\crumb{}` and `\subcrumb{}` commands may be redefined in order to refine the visual presentation of the crumbs, for example:

```
\renewcommand\crumb[2]{\{
  \ifnum\value{section}=\value{crumbi}
    \color{orange}
  \fi
  #1
}}
```

The command is invoked by `\crumbs` with two arguments: the first denotes the short name of the crumb, the second its long form. The counter `crumbi` holds the position of the crumb currently being rendered, indexed from one.

`\subcrumb` The same applies to `\subcrumb{}`, except that the comparison is performed between the `subsection` and `subcrumbi` counters rather than between `section` and `crumbi`.

`\section` The first parameter of both `\crumb{}` and `\subcrumb{}` corresponds to the  
`\subsection` optional argument of `\section{}` and `\subsection{}`, respectively. The second

---

\*The sources are in GitHub at [yegor256/crumbs](https://github.com/yegor256/crumbs)

is their mandatory argument, namely the full text of the section or subsection. Within the `crumbs` package, `\section` and `\subsection` accept an optional argument that is reused in the crumbs and still reaches the table of contents and the running head as usual, for example:

```
\section[Details]{More Details About The Method}
\subsection[SLR]{Systematic Literature Review}
```

The starred forms `\section*{}` and `\subsection*{}` are passed through untouched and produce no crumbs. A `\subsection{}` that precedes the first `\section{}` raises an error, since its subcrumbs would have no section to belong to.

## 2 Package Options

**dry** A “dry” mode may be enabled, which prevents the package from redefining the `\crumblection` `\section{}` and `\subsection{}` commands. The crumbs mechanism nevertheless `\subcrumblection` remains available via the `\crumblection{}` and `\subcrumblection{}` commands, for example:

```
\documentclass{article}
\usepackage[dry]{crumbs}
\begin{document}
\crumblection[Intro]{Introduction} % Add it to \crumbs
\section[Introduction] % Print it to the page
Hello, world!
\end{document}
```

**increment** The `increment` package option instructs the package to step the `section` counter upon each invocation of `\crumblection{}` and the `subsection` counter upon each invocation of `\subcrumblection{}`. This option is intended for the `dry` mode only, since otherwise the redefined `\section{}` and `\subsection{}` would advance their counters twice.

## 3 How It Works

On every compilation, the file `jobname.crumbs` is written afresh, with one line for each `\section` and `\subsection` command.

At the beginning of the next compilation, this file is loaded and it populates the `\crumbs` command with a collection of `\crumb{}` invocations, together with one command per section that aggregates its `\subcrumb{}` invocations and is printed by `\subcrumbs`. The trail therefore always reflects the previous run, just like a table of contents does.

## 4 Implementation

First, we load the `etoolbox` package and declare the `dry` and `increment` options:

```
1 \RequirePackage{etoolbox}
2 \makeatletter
3 \newif\ifcrumbs@dry
```

```

4 \DeclareOption{dry}{\crumbs@drytrue}
5 \newif\ifcrumbs@increment
6 \DeclareOption{increment}{\crumbs@incrementtrue}
7 \makeatother
8 \ProcessOptions\relax

```

`\crumbs@back` The `\crumbs` command is populated from the `jobname.crumbs` file. We define a special command for the backslash character inside that file, as suggested [here](#):

```

9 \makeatletter
10 \newcommand\crumbs@back{\@backslashchar}
11 \makeatother

```

`\crumbs@out` Then, we allocate the output stream `\crumbs@out` and define `\crumbs@write`,  
`\crumbs@write` which writes one purified line to it; the stream stays open for the whole run:

```

12 \makeatletter
13 \newwrite\crumbs@out
14 \ExplSyntaxOn
15 \cs_new:Npn\crumbs@write#1{\immediate\write\crumbs@out{\text_purify:n{#1}}}
16 \ExplSyntaxOff
17 \makeatother

```

`\subcrumbs` The command `\subcrumbs` prints all subcrumbs of the current section:

```

18 \newcommand\subcrumbs{%
19   \ifnum\value{section}=0\else%
20     \expandafter\ifcsname crumbs\romannumeral\the\value{section}\endcsname%
21     \csname crumbs\romannumeral\the\value{section}\endcsname{}%
22   \fi%
23 \fi%
24 }

```

`\crumblection` The command `\crumblection` registers a new crumb:

```

25 \makeatletter
26 \newcommand\crumblection[2][{}]{%
27   \def\crumbs@temp{#1}%
28   \crumbs@write{%
29     \crumbs@back ifx\crumbs@back crumbs\crumbs@back empty%
30     \crumbs@back gappto\crumbs@back crumbs\{\crumbs@back setcounter\{crumbi\}\{0\}\}%
31     \crumbs@back fi%
32     \crumbs@back gappto\crumbs@back crumbs\{\crumbs@back stepcounter\{crumbi\}\crumbs@back cru
33   }%
34   \ifcrumbs@increment\stepcounter{section}\fi%
35 }
36 \makeatother

```

`\subcrumblection` The command `\subcrumblection` registers a new subcrumb, refusing to do so before the first section:

```

37 \makeatletter
38 \newcommand\subcrumblection[2][{}]{%
39   \ifnum\value{section}=0%
40     \PackageError{crumbs}{A subcrumb needs a section, but the section counter is zero}{Put \st
41   \else%
42     \def\crumbs@temp{#1}%
43     \crumbs@write{%

```

```

44     \crumbs@back ifcsname crumbs\romannumeral\the\value{section}\crumbs@back endcsname\crumb
45     \crumbs@back expandafter\crumbs@back newcommand\crumbs@back csname crumbs\romannumeral
46         \crumbs@back setcounter\{subcrumbi\}\{0\}%
47     \}%
48     \crumbs@back fi%
49     \crumbs@back expandafter\crumbs@back gappto\crumbs@back csname crumbs\romannumeral\the\
50         \crumbs@back stepcounter\{subcrumbi\}%
51     \crumbs@back subcrumb{\ifx\crumbs@temp\empty \{#2\}\else \{#1\}\fi}\{#2\}\}%
52 }%
53 \ifcrumbs@increment\stepcounter{subsection}\fi%
54 \fi%
55 }
56 \makeatother

```

`\section` We also redefine the `\section` and `\subsection` commands:

```

\subsection 57 \makeatletter
58 \ifcrumbs@dry%
59   \message{Since "dry" mode is ON we don't renew "section" and "subsection" commands}%
60 \else%
61   \NewCommandCopy\crumbs@oldsection\section
62   \RenewDocumentCommand\section{s o m}{%
63     \IfBooleanTF{#1}%
64       {\crumbs@oldsection*{#3}}%
65       {\IfValueTF{#2}%
66         {\crumbsection[#2]{#3}\crumbs@oldsection[#2]{#3}}%
67         {\crumbsection{#3}\crumbs@oldsection{#3}}}%
68   }
69   \NewCommandCopy\crumbs@oldsubsection\subsection
70   \RenewDocumentCommand\subsection{s o m}{%
71     \IfBooleanTF{#1}%
72       {\crumbs@oldsubsection*{#3}}%
73       {\IfValueTF{#2}%
74         {\subcrumbsection[#2]{#3}\crumbs@oldsubsection[#2]{#3}}%
75         {\subcrumbsection{#3}\crumbs@oldsubsection{#3}}}%
76   }
77 \fi
78 \makeatother

```

`\crumb` We define a default implementation of `\crumb` command:

```

79 \ifcsname crumb\endcsname%
80   \message{The command "crumb" is already defined}%
81 \else%
82   \newcommand\crumb[2]{#1}%
83 \fi%

```

`\subcrumb` We define a default implementation of `\subcrumb` command:

```

84 \ifcsname subcrumb\endcsname%
85   \message{The command "subcrumb" is already defined}%
86 \else%
87   \newcommand\subcrumb[2]{#1}%
88 \fi%

```

`\crumbs` The command `\crumbs` stays empty until the `jobname.crumbs` file populates it:

```

89 \newcommand*\crumbs{}

```

```

crumbi We also define two counters:
subcrumbi 90 \newcounter{crumbi}
          91 \newcounter{subcrumbi}

```

Finally, at the beginning of the document we load the file written by the previous run and then open it for writing again, so that every run produces a fresh one:

```

92 \makeatletter
93 \AtBeginDocument{%
94   \IfFileExists{\jobname.crumbs}{\input{\jobname.crumbs}}{}%
95   \immediate\openout\crumbs@out=\jobname.crumbs\relax%
96 }
97 \AtEndDocument{\immediate\closeout\crumbs@out}
98 \makeatother

```

# Change History

|                                                                                                                                           |                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| v0.2.0                                                                                                                                    |                                                                                                                                                                                                     |
| General: Initial version . . . . .                                                                                                        | 2                                                                                                                                                                                                   |
| v0.4.2                                                                                                                                    |                                                                                                                                                                                                     |
| General: A subsection before the first section raises an error instead of silently appending its subcrumb to the top-level trail. . . . . | 2                                                                                                                                                                                                   |
| Starred sections and subsections are passed through untouched instead of becoming a crumb titled with an asterisk. . . . .                | 2                                                                                                                                                                                                   |
| The crumbs file is rewritten on every run, so sections added or renamed after the first                                                   |                                                                                                                                                                                                     |
|                                                                                                                                           | compilation reach the trail without deleting the file by hand. . . . .                                                                                                                              |
|                                                                                                                                           | 2                                                                                                                                                                                                   |
|                                                                                                                                           | The optional argument of <code>\section</code> and <code>\subsection</code> is forwarded to the original commands, so the table of contents and the running head receive the short title again. . . |
|                                                                                                                                           | 2                                                                                                                                                                                                   |
|                                                                                                                                           | <code>\crumbs@write</code> : Internal helpers are prefixed with <code>crumbs@</code> , so a document may define <code>\temp</code> or <code>\appendtofile</code> without interference. . . . .      |
|                                                                                                                                           | 3                                                                                                                                                                                                   |

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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.

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