

`ffcode`: L^AT_EX Package for Fixed-Font Code Blocks*

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1 Introduction

This package formats source code in articles and ensures it looks nice. After installation from CTAN, the typical usage looks like this (note the `\ff` command and the `ffcode` environment):

<div style="border: 1px solid black; padding: 10px; width: fit-content;"><p>The function <code>fibo()</code> is recursive:</p><pre>1 int fibo(int n) { 2 if (n < 2) { 3 return n; 4 } 5 return fibo(n-1)+fibo(n-2); 6 }</pre><p>Line no. 3 returns <code>n</code> and terminates it.</p></div>	<pre>1 \documentclass{article} 2 \usepackage{ffcode} 3 \pagestyle{empty} 4 \begin{document} 5 The function fibo() is recursive: 6 \begin{ffcode} 7 int fibo(int n) { 8 if (n < 2) { 9 return n; (*@ \label{ln:ret} @*) 10 } 11 return fibo(n-1)+fibo(n-2); 12 } 13 \end{ffcode} 14 Line no.~\ref{ln:ret} returns \ff{n} 15 and terminates it. 16 \end{document}</pre>
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`\ffinput` There is also an `\ffinput` command that reads the content from a file and places it into the document, formatted exactly as it would be if the `ffcode` environment were used. The `ffsave` environment may be used first; it acts like the `ffcode` environment but, instead of printing the content, saves it to a file that can later be read by the `\ffinput` command.

2 Package Options

`samepage` The `samepage` package option prevents page breaks inside `ffcode` blocks.
`noframes` The `noframes` package option omits the light gray frames around `\ff` texts.

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

- nobars** The `nobars` package option omits the vertical gray bar at the left side of each snippet.
- nonumbers** The `nonumbers` package option omits the line numbers.
- nocn** By default, the numbering is continuous: line numbers start at the first snippet and increment until the end of the document. The `nocn` package option (which stands for “no continuous numbering”) restarts the numbering from one in each snippet.
- bold** The `\ff` pieces may be rendered bolder than usual, which may be convenient for some document classes (note the use of the [lmodern](#) package; without it, the bold will not work, as explained [here](#)):

Sometimes it's necessary to make code pieces look bolder, like the `fibo()` function in this text.

```
4 \usepackage{lmodern}
5 \usepackage[bold,noframes]{ffcode}
6 \begin{document}
7 Sometimes it's necessary to make
8 code pieces look bolder, like
9 the |fibo()| function in this text.
10 \end{document}
```

- sf** The font family of `\ff` pieces can be changed to `\sffamily`:

Sometimes a less strictly fixed-width, more elegant look may be preferred, like the `fibo()` here.

```
4 \usepackage[sf,bold,noframes]{ffcode}
5 \begin{document}
6 Sometimes a less strictly fixed-width,
7 more elegant look may be preferred,
8 like the \emph{|fibo()|} here.
9 \end{document}
```

3 Typesetting

The package correctly formats low-height text, for example, just a dot: `.`

A pair of vertical lines decorates a TeX command inside the snippet. A single vertical line can be printed with: “`\char‘\vert|`”.

The command `\ff` behaves differently in math mode — it doesn't add gray frames:

$$x = \int_{\text{home}}^N f(x).$$

```
6 \begin{equation*}
7 x = \int_{\text{home}}^{\text{ff{N}}} f(x).
8 \end{equation*}
```

Lines in the `ffcode` environment can be highlighted, and any additional configuration parameters from the `listings` package can be applied:

<pre> 1 while (true) { 2 print("Hi!") 3 print("Enter your 4 name:") 5 scan(x) 6 print("Your name " 7 + x) 8 } </pre>	<pre> 6 \begin{ffcode}[backgroundcolor=\color{gray!20}] 7 while (true) { 8 (*\textcolor{red}{print("Hi!")})@* 9 print("Enter your name:") 10 scan(x) 11 print("Your name " + x) 12 } 13 \end{ffcode} </pre>
--	---

Using the optional argument of `ffcode`, any other options from the `listings` package can be passed to the snippet.

The `\lstset` command from the `listings` package can also be used to configure defaults for the `ffcode` environment. Unlike the optional argument, which applies only to a single snippet, `\lstset` has a global effect: every subsequent code listing in the document picks up the new settings, including all other `ffcode` blocks that follow it. To keep the change local to a single `ffcode` block, wrap the call in a `\begingroup... \endgroup` pair:

<pre> 1 print("Hi!") </pre>	<pre> 6 \begingroup 7 \lstset{backgroundcolor=\color{yellow!30}} 8 \begin{ffcode} 9 print("Hi!") 10 \end{ffcode} 11 \endgroup 12 \end{document} </pre>
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A snippet can be rendered in “condensed” mode, with smaller spacing between letters, by passing `columns=fixed` together with a narrower `basewidth` from the `listings` package:

<pre> 1 while (true) { 2 print("Enter your name:") 3 scan(x) 4 print("Hello, " + x) 5 } </pre>	<pre> 6 \begin{ffcode}[columns=fixed,basewidth=0.4em] 7 while (true) { 8 print("Enter your name:") 9 scan(x) 10 print("Hello, " + x) 11 } 12 \end{ffcode} </pre>
--	---

4 Implementation

First, we parse package options with the help of `pgfopts` package:

```

1 \RequirePackage{pgfopts}
2 \pgfkeys{
3   /ff/.cd,
4   bold/.store in=\ff@bold,
5   sf/.store in=\ff@sf,
6   samepage/.store in=\ff@samepage,
7   noframes/.store in=\ff@noframes,
8   nonumbers/.store in=\ff@nonumbers,

```

```

9 nobars/.store in=\ff@nobars,
10 novert/.store in=\ff@novert,
11 nocn/.store in=\ff@nocn,
12 }
13 \ProcessPgfpPackageOptions{/ff}

```

Then, we include the `xcolor` package:

```
14 \RequirePackage{xcolor}
```

Then, we configure the `listings` package. The defaults are applied here, at package load, so that a user may override them globally with `\lstset` after `\usepackage{ffcode}`:

```

15 \RequirePackage{listings}
16 \makeatletter
17 % See \href{https://tex.stackexchange.com/questions/706858}{the explanation}:
18 \lst@AddToHook{Init}{\setlength{\lineskip}{0pt}}
19 \lstset{breaklines}
20 \lstset{escapeinside={(*@}{@*)}}
21 \lstset{basicstyle={\ttfamily}}
22 \lstset{columns=fullflexible}
23 \lstset{keepspace=true}
24 \ifdefined\ff@nonumbers\else
25   \lstset{numbers=left,numbersep=.8em,
26     numberstyle={\tiny\sffamily\color{gray}},
27     xleftmargin=2.5em}
28 \fi
29 \ifdefined\ff@nobars\else
30   \lstset{frame=leftline,framerule=.05em,rulecolor={\color{gray}}}
31 \fi
32 \ifdefined\ff@nocn\else
33   \lstset{firstnumber=last}
34 \fi
35 \makeatother

```

Then, we define a supplementary command `\ff@set` that applies per-environment options on top of the global defaults:

```

36 \makeatletter
37 \newcommand\ff@set[1]{\lstset{#1}}
38 \makeatother

```

`ffcode` Then, we define the `ffcode` environment and its supplementary `ffcode*` counterpart:

```

39 \makeatletter
40 \lstnewenvironment{ffcode}[1]{}
41   {\ff@set{#1}\ifdefined\ff@samepage\noindent\minipage{\linewidth}\fi}
42   {\ifdefined\ff@samepage\endminipage\fi}
43 \makeatother

```

`ffinput` Then, we define the `\ffinput` command:

```

44 \makeatletter
45 \newcommand\ffinput[2][{}]{%
46   \ff@set{#1}%
47   \ifdefined\ff@samepage\noindent\minipage{\linewidth}\fi%
48   \lstinputlisting[#1]{#2}%
49   \ifdefined\ff@samepage\endminipage\fi%

```

```

50 }
51 \makeatother

```

ffsave Then, we define the ffsave environment:

```

52 \RequirePackage{fancyvrb}
53 \newenvironment{ffsave}[1][ffsave.txt]
54 { \VerbatimEnvironment \begin{VerbatimOut}{#1} }
55 { \end{VerbatimOut} }

```

\ff@print Then, we define a supplementary macro `\ff@print`:

```

56 \makeatletter
57 \newcommand\ff@print[1]{%
58   \textnormal{%
59     \ifdefined\ff@sf\sffamily\else\ttfamily\fi%
60     \ifdefined\ff@bold\fontseries{b}\selectfont\fi%
61     #1%
62   }%
63 }
64 \makeatother

```

\ff@rule Then, we define a supplementary command `\ff@rule`:

```

65 \makeatletter\newcommand\ff@rule
66 { \vrule height 0.6em depth 0.1em width 0em }
67 \makeatother

```

\ff@box Then, we use [tcolorbox](#) to define the `\ff@box` command for a gray box around a verbatim text block:

```

68 \makeatletter
69 \ifdefined\ff@noframes\else
70   \RequirePackage{tcolorbox}
71   \newtcbbox\ff@box{nobeforeafter,colframe=gray!80!white,
72     colback=gray!5!white,boxrule=0.01em,arc=0.1em,
73     boxsep=0.12em,left=0.05em,right=0.05em,top=0.02em,bottom=0.02em,
74     tcbbox raise base}
75 \fi
76 \makeatother

```

\ff@x Then, we define the internal `\ff@x` command for printing a piece of fixed-width-font text:

```

77 \makeatletter
78 \NewDocumentCommand\ff@x{v}{\ff{#1}}
79 \makeatother

```

\ff Then, we define `\ff` macro:

```

80 \makeatletter
81 \newcommand\ff[1]{%
82   \ifdefined\ff@noframes%
83     \ff@rule\ff@print{#1}%
84   \else%
85     \relax\ifmmode%
86       \ff@rule\ff@print{#1}%
87     \else%
88       \ff@box{\ff@rule\ff@print{#1}}%

```

```

89     \fi%
90     \fi%
91 }
92 \makeatother

```

novert Finally, we let vertical bars work similarly to `\ff`, as suggested [here](#) and [here](#) (unless the **novert** package option is used):

```

93 \makeatletter\ifdefined\ff@novert\else
94   \catcode'\|\active
95   \AtBeginDocument{\catcode'\|\active\protected\def|{\ff@x|}}
96   \catcode'\| 12 %
97 \fi\makeatother

98 \endinput

```

Change History

v0.1.0		v0.3.0	
General: Initial version	3	General: Package option <code>nocn</code>	
v0.10.0		added.	3
General: Package option <code>samepage</code>		v0.4.0	
added, to prevent each <code>ffcode</code>		General: Package option <code>nobars</code>	
block from breaking across		added.	3
pages.	3	v0.5.1	
<code>ffinput</code> : The <code>\ffinput</code> command		<code>\ff@print</code> : Now, the command <code>ff</code>	
added.	4	ignores italic and bold and	
v0.10.2		always prints <code>\texttt</code> as it	
General: We started to use		should be.	5
<code>keepspaces</code> in order to		v0.6.0	
guarantee correct visual		General: Package option <code>novert</code>	
rendering of multi-spaced		added, to disable the	
content.	4	redefinition of the vertical bar.	3
v0.11.0		We use <code>pgfopts</code> instead of	
<code>ffsave</code> : The <code>ffsave</code> environment		<code>xkeyval</code> .	3
added.	5	v0.7.0	
v0.11.1		General: Package option <code>bold</code>	
General: Reserve <code>xleftmargin</code> for		added, to make all <code>\ff</code> pieces	
line numbers so they sit inside		look bolder than usual.	3
the column instead of		Package option <code>sf</code> added, to	
protruding into the page		print all <code>\ff</code> pieces with	
margin.	3	<code>\sffamily</code> .	3
v0.12.0		v0.8.0	
General: Static <code>\lstset</code> defaults		<code>\ff</code> : The <code>\ff</code> command is now a	
moved from the		normal command, not	
per-environment hook to the		verbatim.	5
preamble, so that user-supplied		v0.9.0	
<code>\lstset</code> calls are no longer		General: The <code>minted</code> package is	
overwritten on every <code>ffcode</code>		replaced by the <code>listings</code>	
usage.	4	package.	4
v0.2.0		v0.9.2	
General: Package options		General: All lengths and sizes are	
<code>nonumbers</code> and <code>noframes</code>		in "em" instead of "pt".	3
added.	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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