

# `ffcode`: L<sup>A</sup>T<sub>E</sub>X Package for Fixed-Font Code Blocks\*

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## 1 Introduction

This package typesets source code within articles and ensures a tidy, consistent appearance. Following installation from CTAN, the typical usage proceeds as follows (note the `\ff` command and the `ffcode` environment):

<pre>The function <code>fibonacci()</code> is recursive: 1 int fibonacci(int n) { 2   if (n &lt; 2) { 3     return n; 4   } 5   return fibonacci(n-1)+fibonacci(n-2); 6 } Line no. 3 returns <code>n</code> and terminates it.</pre>	<pre>1 \documentclass{article} 2 \usepackage{ffcode} 3 \pagestyle{empty} 4 \begin{document} 5 The function  fibonacci()  is recursive: 6 \begin{ffcode} 7 int fibonacci(int n) { 8   if (n &lt; 2) { 9     return n; (*@ \label{ln:ret} @*) 10  } 11  return fibonacci(n-1)+fibonacci(n-2); 12 } 13 \end{ffcode} 14 Line no.~\ref{ln:ret} returns \code{n} 15 and terminates it. 16 \end{document}</pre>
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`\ffinput` An `\ffinput` command is also provided, which reads content from a file and inserts it into the document, formatted in precisely the manner that would result from the `ffcode` environment. The `ffsave` environment may be employed beforehand; it behaves as the `ffcode` environment, save that the content is written to a file rather than printed, whence it may subsequently be retrieved by the `\ffinput` command.

## 2 Package Options

`samepage` The `samepage` package option prevents page breaks inside `ffcode` blocks.

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

- `noframes` The `noframes` package option omits the light gray frames around `\ff` texts.
- `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, line numbering is continuous: numbers commence at the first snippet and increment until the end of the document. The `nocn` package option (an abbreviation for “no continuous numbering”) causes the numbering to restart from one in each snippet.
- `bold` The `\ff` fragments may be rendered in a heavier weight than the default, which proves convenient for certain document classes (note the use of the [lmodern](#) package: without it, boldface fails to operate, as explained [here](#)):

Sometimes it's necessary to make code pieces look bolder, like the `fibonacci` 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 |fibonacci| function in this text.
10 \end{document}
```

- `sf` The font family of `\ff` fragments may be altered to `\sffamily`:

Sometimes a less strictly fixed-width, more elegant look may be preferred, like the `fibonacci` 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{|fibonacci|} here.
9 \end{document}
```

### 3 Typesetting

The package handles low-height text correctly, for instance a solitary dot: `\ff.`

A pair of vertical bars decorates a  $\TeX$  command within a snippet. A single vertical bar may be produced by means of “`\char‘\vert`”.

The `\ff` command behaves differently in math mode—it adds no grey frames:

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

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

Lines within the `ffcode` environment may be highlighted, and any further configuration parameters from the `listings` package may likewise be supplied:

<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>
--	---

By means of the optional argument of `ffcode`, any other options from the `listings` package may be conveyed to the snippet.

The `\lstset` command of the `listings` package may also be employed to establish defaults for the `ffcode` environment. In contrast to the optional argument, which applies solely to a single snippet, `\lstset` acts globally: every subsequent code listing in the document inherits the new settings, including any further `ffcode` blocks thereafter. To confine the change to a single `ffcode` block, the call should be wrapped within 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>
-----------------------------	--

A snippet may be rendered in “condensed” mode, with reduced spacing between letters, by supplying `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 \ProcessPgfPackageOptions{/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\noident\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   \ifdefined\ff@samepage\noident\minipage{\linewidth}\fi%
47   \lstinputlisting[#1]{#2}%
48   \ifdefined\ff@samepage\endminipage\fi%
49 }

```

```

50 \makeatother

ffsave Then, we define the ffsave environment:
51 \RequirePackage{fancyvrb}
52 \newenvironment{ffsave}[1][ffsave.txt]
53   {\VerbatimEnvironment\begin{VerbatimOut}{#1}}
54   {\end{VerbatimOut}}

\ff@print Then, we define a supplementary macro \ff@print:
55 \makeatletter
56 \newcommand\ff@print[1]{%
57   \textnormal{%
58     \ifdefined\ff@sf\sffamily\else\ttfamily\fi%
59     \ifdefined\ff@bold\fontseries{b}\selectfont\fi%
60     #1%
61   }%
62 }
63 \makeatother

\ff@rule Then, we define a supplementary command \ff@rule:
64 \makeatletter\newcommand\ff@rule
65   {\vrule height 0.6em depth 0.1em width 0em}
66 \makeatother

\ff@box Then, we use tcolorbox to define the \ff@box command for a gray box around a
verbatim text block:
67 \makeatletter
68 \ifdefined\ff@noframes\else
69   \RequirePackage{tcolorbox}
70   \newtcbox\ff@box{nobeforeafter,colframe=gray!80!white,
71     colback=gray!5!white,boxrule=0.01em,arc=0.1em,
72     boxsep=0.12em,left=0.05em,right=0.05em,top=0.02em,bottom=0.02em,
73     tcbox raise base}
74 \fi
75 \makeatother

\ff@x Then, we define the internal \ff@x command for printing a piece of fixed-width-font
text:
76 \makeatletter
77 \NewDocumentCommand\ff@x{v}{\ff{#1}}
78 \makeatother

\ff Then, we define \ff macro:
79 \makeatletter
80 \newcommand\ff[1]{%
81   \ifdefined\ff@noframes%
82     \ff@rule\ff@print{#1}%
83   \else%
84     \relax\ifmmode%
85       \ff@rule\ff@print{#1}%
86     \else%
87       \ff@box{\ff@rule\ff@print{#1}}%
88     \fi%

```

```

89 \fi%
90 }
91 \makeatother

```

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

```

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

97 \endinput

```

## Change History

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