mindflow – write your ideas in a clear way

Jinwen Xu

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1. Introduction

The mindflow package provides you a way to write your ideas and annotations clearly. For example, with the options `linenumber` and `rightmarker`, you will get something like:

1 What to write next: *
2   • usage: the initialization, options and configuration;   *
3   • an example;   *
4   • some word on the line numbering feature;   *
5   • some internal macros;   *
6   • the complete code.   *

This example only shows the default effect. You can customize it further according to the instructions in the next section.

2. The usage

2.1 How to load it ?

Simply load the package with

```
\usepackage{mindflow}
```

By default, the environment has no line numbers or markers. You can use the following options (they can be specified directly, like `off`, or as a boolean optional, like `off=false`):

`linenumber`	Same as `leftlinenumber`
`leftlinenumber`	Enable left line numbers
`rightlinenumber`	Enable right line numbers
`leftmarker`	Enable left marker, by default it is a "*"
`rightmarker`	Enable right marker, by default it is a "*"
`incolumn`	The separation line would fit in the column (*automatically applied in two-column documents*)
`off`, `on`	Turn the `mindflow` environments *off* or *on*

Additionally, there is an option `nonbreakble`, which enables the tcolorbox version, permits a background color, but is not breakable and doesn't support line numbering quite well.

2.2 How to use it ?

{mindflow} You can then use the `mindflow` environment as

```
\begin{mindflow}
    ⟨text⟩
\end{mindflow}
```

2.3 Further configuration

\mindflowset You can use `\mindflowset{⟨configuration⟩}` to configure the `mindflow` environment. The available keys are listed at the top of the next page.

1

left	The left marker	right	The right marker
textcolor	Color of the text	textfont	Font of the text
numcolor	Color of line numbers	numfont	Font of line numbers
markercolor	Color of the markers	markerfont	Font of the marker
linecolor	Color of the separation line	lineheight	Height of the separation line

Additionally, all the options mentioned in the previous section (except for `nonbreakble`) can be set with `\mindflowset`. *

3. An example

With the following settings:

```
\mindflowset{
    leftlinenumber, rightlinenumber, leftmarker, rightmarker,
    linecolor   = green!50!black,
    textcolor   = blue!50!cyan,
    numcolor    = red!50!orange,
    markercolor = orange,
    textfont    = \footnotesize\sffamily\itshape,
    numfont     = \small\footnotesize\ttfamily,
    markerfont  = \footnotesize\sffamily,
    left        = \hspace{1em}\(\succ\),
    right       = \(\prec\)\hspace{1em},
    lineheight  = 1pt
}
```

One will have something like this:

7	≻	*Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read*	≺	7
8	≻	*this text, you will get no information. Really? Is there no information? Is there a difference between this text and some*	≺	8
9	≻	*nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how*	≺	9
10	≻	*the letters are written and an impression of the look.*	≺	10

4. About the line numbers

1 You can also add line numbers to the other part of your document in the usual way. For
2 example, line numbers have been turned on for this paragraph with `\linenumbers`.

11 Line numbers within the mindflow environments are independent from those of the main text.   *

3 (*I recommend that you put an empty line before and after the mindflow environments, i.e. make the*
4 mindflow *environment a paragraph of its own. This way, your paragraph structure won't get changed*
5 *when you use the* `off` *option.*)

The line numbering feature is provided by the package lineno. For more details, please refer to its documentation. Notice that, by default, displayed equations are not numbered. You can add the following line before `\usepackage{mindflow}`:

```
\PassOptionsToPackage{mathlines}{lineno}
```

to enable the line numbers for displayed equations.

$$
12 \qquad\qquad (a + b)^2 = a^2 + 2ab + b^2 \qquad\qquad *
$$
$$
13 \qquad\qquad (a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 \qquad\qquad *
$$

---

*If the package option `nonbreakble` is enabled, then there is also a key `backgroundcolor`, similar to `textcolor`, for configuring the background color of the mindflow environments.

5. SOME TEXNICAL DETAILS

5.1 Internal macro for text elements

\mindflowTextFont
\mindflowNumFont
\mindflowMarkerFont

The font for text, line numbers and markers within the mindflow environments can be specified by redefining \mindflowTextFont, \mindflowNumFont and \mindflowMarkerFont. By default, they are defined as:

```
\newcommand{\mindflowTextFont}{\footnotesize}
\newcommand{\mindflowNumFont}{\scriptsize\ttfamily}
\newcommand{\mindflowMarkerFont}{\scriptsize\ttfamily}
```

\mindflowLeft
\mindflowRight

The left and right markers is defined by \mindflowLeft and \mindflowRight. Both have the default value "*".

\mindflowLineHeight

The height of the separation lines is a length macro named \mindflowLineHeight, with default value 0.4pt. You can change this with \setlength.

5.2 Internal name of the colors

mindflowLine
mindflowText
mindflowNum
mindflowMarker

And finally, the colors for the separation lines, text, line numbers and markers within the mindflow environments are called mindflowLine, mindflowText, mindflowNum and mindflowMarker, respectively. By default, they have the same color as the context, with opacity 40% for the separation lines and text, 20% for the markers, and 8% for line numbers.

*mindflowBackground

If the package option nonbreakable is enabled, then there is also the background color mindflowBackground, which by default is white.

6. THE SAME EXAMPLE

With option leftlinenumber, rightlinenumber, leftmarker, rightmarker and the following settings:

```
\colorlet{mindflowLine}{green!50!black}
\colorlet{mindflowText}{blue!50!cyan}
\colorlet{mindflowNum}{red!50!orange}
\colorlet{mindflowMarker}{orange}
\renewcommand{\mindflowTextFont}{\footnotesize\sffamily\itshape}
\renewcommand{\mindflowNumFont}{\small\footnotesize\ttfamily}
\renewcommand{\mindflowMarkerFont}{\footnotesize\sffamily}
\renewcommand{\mindflowLeft}{\hspace{1em}\(\succ\)}
\renewcommand{\mindflowRight}{\(\prec\)\hspace{1em}}
\setlength{\mindflowLineHeight}{1pt}
```

One will get the same result as in the previous example.

7. KNOWN ISSUES

- There is no absolute guarantee that the separation lines will not fall alone at the top or bottom of the page, though great effort has been made to reduce the occurrence of such situation.
- The nonbreakable version doesn't support line numbering quite well, especially for displayed equations. This is due to the usage of internallinenumbers.

8. Implementation

Below is the complete source code of this package.

```latex
1  \RequirePackage{kvoptions}
2  \SetupKeyvalOptions{%
3      family = @mindflow,
4      prefix = @mindflow@
5  }
6  \DeclareBoolOption[true]{on}                  % Turn on mindflow
7  \DeclareBoolOption[false]{off}                % Turn off mindflow
8  \DeclareBoolOption[false]{leftmarker}         % Left marker
9  \DeclareBoolOption[false]{rightmarker}        % Right marker
10 \DeclareBoolOption[false]{linenumber}         % Left line numbers
11 \DeclareBoolOption[false]{leftlinenumber}     % Left line numbers
12 \DeclareBoolOption[false]{rightlinenumber}    % Right line numbers
13 \DeclareBoolOption[false]{incolumn}           % Separation line fits in column
14 \DeclareBoolOption[false]{nonbreakable}       % Use the tcolorbox version
15
16 \ProcessKeyvalOptions*\relax
17
18 \if@mindflow@on
19   \@mindflow@offfalse
20 \fi
21 \if@mindflow@linenumber
22   \@mindflow@leftlinenumbertrue
23 \fi
24
25 %%==============================
26 %% Initialization
27 %%==============================
28 \RequirePackage{lineno}
29 \RequirePackage{xcolor}
30
31 \colorlet{mfSavedColor}{.}
32 \colorlet{mindflowLine}{mfSavedColor!40}
33 \colorlet{mindflowText}{mfSavedColor!40}
34 \colorlet{mindflowMarker}{mfSavedColor!20}
35 \colorlet{mindflowNum}{mfSavedColor!8}
36
37 \newcommand{\mindflowTextFont}{\footnotesize}
38 \newcommand{\mindflowNumFont}{\scriptsize\ttfamily}
39 \newcommand{\mindflowMarkerFont}{\scriptsize\ttfamily}
40 \newcommand{\mindflowLeft}{*}
41 \newcommand{\mindflowRight}{*}
42 \newlength{\mindflowLineHeight}
43 \setlength{\mindflowLineHeight}{0.4pt}
44
45 %%==============================
46 %% The mindflow environment
47 %%==============================
48 \PassOptionsToPackage{all}{nowidow}
49 \RequirePackage{nowidow}
50 \RequirePackage{verbatim}
51
52 \newif\ifLNturnsON
```

```latex
53 \def\LocallyStopLineNumbers{\LNturnsONfalse%
54     \ifLineNumbers\LNturnsONtrue\fi\nolinenumbers}
55 \def\ResumeLineNumbers{\ifLNturnsON\linenumbers\fi}
56
57 \newif\ifICturnsON
58 \def\AutoIncolumn{\ICturnsONfalse%
59     \if@mindflow@incolumn\ICturnsONtrue\fi%
60     \if@twocolumn\@mindflow@incolumntrue\fi%
61 }
62 \def\ResumeIncolumn{\ifICturnsON\@mindflow@incolumntrue\fi}
63
64 \newcounter{recordLN}
65 \newcounter{mfLN}
66 \setcounter{mfLN}{1}
67
68 \newcommand*{\mfSepLine}{%
69   \par%\nobreak%
70   \LocallyStopLineNumbers%
71   \vspace*{-.5\baselineskip}%
72   \noindent%
73   \if@mindflow@incolumn%
74     \makebox[\linewidth]{\color{mindflowLine}\rule{\linewidth}{\
      mindflowLineHeight}}%
75   \else%
76     \hspace*{-\paperwidth}%
77     \makebox[\linewidth]{\color{mindflowLine}\rule{4\paperwidth}{\
      mindflowLineHeight}}%
78   \fi%
79   \par%\nobreak%
80   \ResumeLineNumbers%
81 }
82
83 \newcommand{\mindflow@makeLineNumber}{%
84   \hss%
85   \if@mindflow@leftlinenumber%
86     \normalfont\mindflowNumFont\color{mindflowNum}\LineNumber\hspace{1em}%
87   \fi%
88   \color{mindflowMarker}%
89   \if@mindflow@leftmarker%
90     \normalfont\mindflowMarkerFont\mindflowLeft\hspace{1em}%
91   \fi%
92   \rlap{\hskip\textwidth%
93     \if@mindflow@rightmarker%
94       \hspace{1em}\mindflowRight%
95     \fi%
96     \if@mindflow@rightlinenumber%
97       \hspace{1em}%
98       \normalfont\mindflowNumFont\color{mindflowNum}\LineNumber%
99     \fi%
100   }%
101 }%
102
103 \let\mindflowOFF=\comment
104 \let\endmindflowOFF=\endcomment
105
106 \def\mindflowON{%
```

```latex
107    \postdisplaypenalty=10000
108    \parskip=0pt
109    \medskip%
110    \setcounter{recordLN}{\value{linenumber}}%
111    \setcounter{linenumber}{\value{mfLN}}%
112    \AutoIncolumn%
113    \mfSepLine%
114    \normalfont\mindflowTextFont\color{mindflowText}%
115    \linenumbers%
116    \let\makeLineNumber\mindflow@makeLineNumber%
117    \nopagebreak%
118 }
119 \def\endmindflowON{%
120    \nowidow[3]%
121    \mfSepLine%
122    \setcounter{mfLN}{\value{linenumber}}%
123    \setcounter{linenumber}{\value{recordLN}}%
124    \ResumeIncolumn%
125    \medskip%
126 }
127
128 \colorlet{mindflowBackground}{white}
129
130 \if@mindflow@nonbreakable
131 \PassOptionsToPackage{many}{tcolorbox}
132 \RequirePackage{tcolorbox}
133 \newlength{\mindflow@parindent}
134 \newlength{\mindflow@parskip}
135 \newtcolorbox{mindflow@nonbreakable}[1]{
136    enhanced jigsaw,
137    colback=mindflowBackground,colframe=mindflowLine,
138    leftrule=0pt, rightrule=0pt, sharp corners,
139    toprule=\mindflowLineHeight, bottomrule=\mindflowLineHeight,
140    boxsep=0pt, top=.3\baselineskip, bottom=.3\baselineskip,
141    fontupper=\mindflowTextFont,extras={colupper={mindflowText}},
142    before upper={
143        \setlength{\parindent}{\mindflow@parindent}%
144        \setlength{\parskip}{\mindflow@parskip}%
145    },#1
146 }
147 \def\mindflowON{%
148    \LocallyStopLineNumbers%
149    \setcounter{recordLN}{\value{linenumber}}%
150    \setcounter{linenumber}{\value{mfLN}}%
151    \AutoIncolumn%
152    \setlength{\mindflow@parindent}{\parindent}%
153    \setlength{\mindflow@parskip}{\parskip}%
154    \if@mindflow@incolumn%
155        \begin{mindflow@nonbreakable}{left=0pt,right=0pt}
156    \else%
157        \begin{mindflow@nonbreakable}{%
158            grow to left by=\linewidth,left=\linewidth,
159            grow to right by=\linewidth,right=\linewidth}
160    \fi
161    \begin{internallinenumbers}%
162        \let\makeLineNumber\mindflow@makeLineNumber%
```

```latex
163 }
164 \def\endmindflowON{%
165        \nowidow[3]%
166      \end{internallinenumbers}%
167    \end{mindflow@nonbreakable}\par%
168    \ResumeLineNumbers%
169    \setcounter{mfLN}{\value{linenumber}}%
170    \setcounter{linenumber}{\value{recordLN}}%
171    \ResumeIncolumn%
172 }
173 \fi
174
175 \if@mindflow@off
176   \let\mindflow=\mindflowOFF
177   \let\endmindflow=\endmindflowOFF
178 \else
179   \let\mindflow=\mindflowON
180   \let\endmindflow=\endmindflowON
181 \fi
182
183 %%===============================
184 %% \mindflowset
185 %%===============================
186 \define@key{mindflow}{on}[true]{%
187   \csname @mindflow@on#1\endcsname%
188   \if@mindflow@off%
189     \let\mindflow=\mindflowOFF%
190     \let\endmindflow=\endmindflowOFF%
191   \else%
192     \let\mindflow=\mindflowON%
193     \let\endmindflow=\endmindflowON%
194   \fi%
195 }
196 \define@key{mindflow}{off}[true]{%
197   \csname @mindflow@off#1\endcsname%
198   \if@mindflow@off%
199     \let\mindflow=\mindflowOFF%
200     \let\endmindflow=\endmindflowOFF%
201   \else%
202     \let\mindflow=\mindflowON%
203     \let\endmindflow=\endmindflowON%
204   \fi%
205 }
206 \define@key{mindflow}{leftmarker}[true]{\csname @mindflow@leftmarker#1\
        endcsname}
207 \define@key{mindflow}{rightmarker}[true]{\csname @mindflow@rightmarker#1\
        endcsname}
208 \define@key{mindflow}{linenumber}[true]{\csname @mindflow@leftlinenumber#1\
        endcsname}
209 \define@key{mindflow}{leftlinenumber}[true]{\csname
        @mindflow@leftlinenumber#1\endcsname}
210 \define@key{mindflow}{rightlinenumber}[true]{\csname
        @mindflow@rightlinenumber#1\endcsname}
211 \define@key{mindflow}{incolumn}[true]{\csname @mindflow@incolumn#1\
        endcsname}
212 \define@key{mindflow}{linecolor}{\colorlet{mindflowLine}{#1}}
```

```latex
213 \define@key{mindflow}{textcolor}{\colorlet{mindflowText}{#1}}
214 \define@key{mindflow}{numcolor}{\colorlet{mindflowNum}{#1}}
215 \define@key{mindflow}{markercolor}{\colorlet{mindflowMarker}{#1}}
216 \define@key{mindflow}{backgroundcolor}{
217   \if@mindflow@nonbreakable
218     \colorlet{mindflowBackground}{#1}
219   \else
220     \PackageWarning{mindflow}{The key ``backgroundcolor'' is only available
        when the package option\MessageBreak ``nonbreakable'' is enabled.}
221   \fi
222 }
223 \define@key{mindflow}{textfont}{\renewcommand{\mindflowTextFont}{#1}}
224 \define@key{mindflow}{numfont}{\renewcommand{\mindflowNumFont}{#1}}
225 \define@key{mindflow}{markerfont}{\renewcommand{\mindflowMarkerFont}{#1}}
226 \define@key{mindflow}{left}{\renewcommand{\mindflowLeft}{#1}}
227 \define@key{mindflow}{right}{\renewcommand{\mindflowRight}{#1}}
228 \define@key{mindflow}{lineheight}{\setlength{\mindflowLineHeight}{#1}}
229 \newcommand{\mindflowset}[1]{%
230   \setkeys{mindflow}{#1}%
231 }
232
233 %%================================
234 %% lineno patch
235 %%================================
236 \ifdefined\linenomathpatch\else
237   \RequirePackage{amsmath}
238   \RequirePackage{etoolbox}
239   \newcommand*\linenomathpatch[1]{%
240     \cspreto{#1}{\linenomath}%
241     \cspreto{#1*}{\linenomath}%
242     \csappto{end#1}{\endlinenomath}%
243     \csappto{end#1*}{\endlinenomath}%
244   }
245   \newcommand*\linenomathpatchAMS[1]{%
246     \cspreto{#1}{\linenomathAMS}%
247     \cspreto{#1*}{\linenomathAMS}%
248     \csappto{end#1}{\endlinenomath}%
249     \csappto{end#1*}{\endlinenomath}%
250   }
251   \expandafter\ifx\linenomath\linenomathWithnumbers
252     \let\linenomathAMS\linenomathWithnumbers
253     \patchcmd\linenomathAMS{\advance\postdisplaypenalty\linenopenalty
      }{}{}{}
254   \else
255     \let\linenomathAMS\linenomathNonumbers
256   \fi
257   \linenomathpatch{equation}
258   \linenomathpatchAMS{gather}
259   \linenomathpatchAMS{multline}
260   \linenomathpatchAMS{align}
261   \linenomathpatchAMS{alignat}
262   \linenomathpatchAMS{flalign}
263 \fi
```