Introduction

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

\begin{mindflow}
\begin{itemize}
  \item usage: the initialization, options and configuration;
  \item an example maybe;
  \item some word on the line numbering feature;
  \item some internal macros and the complete code.
\end{itemize}
\end{mindflow}

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

The usage

2.1 How to load it?

Simply load the package with

\begin{mindflow}
\end{mindflow}

By default, there are no decorations like line numbers or markers. To enable them, you can use the following options (they can be specified directly, like \texttt{off}, or as a boolean optional, like \texttt{off=false}):

\begin{itemize}
  \item \texttt{linenumber}: Enable line numbering feature, same as \texttt{leftlinenumber}
  \item \texttt{mathlines}: Enable line numbers for displayed equations
  \item \texttt{leftlinenumber}: Enable left line numbers
  \item \texttt{rightlinenumber}: Enable right line numbers
  \item \texttt{leftmarker}: Enable left marker, by default it is an asterisk \texttt{*}
  \item \texttt{rightmarker}: Enable right marker, by default it is an asterisk \texttt{*}
  \item \texttt{incolumn}: The separation line would fit in the column
    \textit{(automatically applied in two-column documents)}
  \item \texttt{off, on}: Turn the \texttt{mindflow} environments \texttt{off} or \texttt{on}
\end{itemize}

There is also an option \texttt{nonbreakable}, which enables the \texttt{tcolorbox} version, permitting a background color, but is not breakable and does not support line numbering quite well.

2.2 How to use it?

\begin{mindflow} \end{mindflow}

\begin{mindflow} \end{mindflow}

2.3 Further configurations

\begin{mindflowset} \end{mindflowset}

You can use \texttt{\mindflowset\{(configuration)\}} to further configure the \texttt{mindflow} environment. The available keys are listed at the top of the next page.

\begin{mindflowset} \end{mindflowset}
Additionally, most of the options mentioned in the previous section (except for `nonbreakable` and `mathlines`) can be set with `\mindflowset`.

### 3 An example

With the following settings:

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

One will get something like this (a little bit exaggerated, to be honest):

---

```
6 ≻ 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 ≺ this text, you will get no information. Really? Is there no information? Is there a difference between this text and some
8 ≻ nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how
9 ≺ the letters are written and an impression of the look.
```

### 4 About the line numbers

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

---

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

The line numbering feature is provided by package `lineno`. For more details, please refer to its documentation. Notice that displayed equations are not numbered by default. To enable the line numbers for them, you can use the option `mathlines`. The result would be like:

\[
\sum_{1 \leq i < \cdots < i_n \leq n} i_j^{-2} = \frac{\pi^{2n}}{(2n+1)!}
\]

\[
\Rightarrow \frac{e^n - e^{-n}}{2n} = 1 + \sum_{n \geq 1} \sum_{1 \leq i < \cdots < i_n \leq n} i_j^{-2}
\]

---

*If the package option `nonbreakable` 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 macros for text elements

\mindflowTextFont 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 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 \(0.4\text{pt}\). You can change this with \setlength.

5.2 Internal names of the colors

mindflowLine 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.

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

6 The same example revisited

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\sf\itshape}
\renewcommand{\mindflowNumFont}{\small\footnotesize\ttfamily}
\renewcommand{\mindflowMarkerFont}{\footnotesize}\renewcommand{\mindflowLeft}{\text{\hspace{1em}\(\succ\)}}
\renewcommand{\mindflowRight}{\text{\(\prec\)\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 does not support line numbering quite well, especially for displayed equations. This is due to the usage of internallinenumbers.
Below is the complete source code of this package.

\RequirePackage{kvoptions}
\SetupKeyvalOptions{
  family = @mindflow,
  prefix = @mindflow@}
\DeclareBoolOption[true]{on} % Turn on mindflow
\DeclareBoolOption[false]{off} % Turn off mindflow
\DeclareBoolOption[false]{leftmarker} % Left marker
\DeclareBoolOption[false]{rightmarker} % Right marker
\DeclareBoolOption[false]{linenumber} % Left line numbers
\DeclareBoolOption[false]{leftlinenumber} % Left line numbers
\DeclareBoolOption[false]{rightlinenumber} % Right line numbers
\DeclareBoolOption[false]{incolumn} % Separation line fits in column
\DeclareBoolOption[false]{nonbreakable} % Use the tcolorbox version
\DeclareBoolOption[false]{mathlines} % Add line numbers to equations
\ProcessKeyvalOptions*\relax
\if@mindflow@on
  \@mindflow@offfalse
\fi
\if@mindflow@linenumber
  \@mindflow@leftlinenumbertrue
\fi
\if@mindflow@mathlines
  \PassOptionsToPackage{mathlines}{lineno}
\fi
\PassOptionsToPackage{all}{nowidow}
\RequirePackage{nowidow}
\colorlet{mfSavedColor}{.}
\colorlet{mindflowLine}{mfSavedColor!40}
\colorlet{mindflowText}{mfSavedColor!40}
\colorlet{mindflowMarker}{mfSavedColor!20}
\colorlet{mindflowNum}{mfSavedColor!8}
\newcommand{\mindflowTextFont}{\footnotesize}
\newcommand{\mindflowNumFont}{\scriptsize\ttfamily}
\newcommand{\mindflowMarkerFont}{\scriptsize\ttfamily}
\newcommand{\mindflowLeft}{*}
\newcommand{\mindflowRight}{*}
\newlength{\mindflowLineHeight}
\setlength{\mindflowLineHeight}{0.4pt}
\PassOptionsToPackage{all}{nowidow}
\ RequirePackage{nowidow}
\RequirePackage{verbatim}
\newif\ifLNturnsON
\def\LocallyStopLineNumbers{\LNturnsONfalse% 
  \ifLineNumbers\LNturnsONtrue\fi
  \nolinenumbers}
\def\ResumeLineNumbers{\ifLNturnsON\linenumbers\fi}
\newif\ifICturnsON
\def\AutoIncolumn{\ICturnsONfalse%
  \if@mindflow@incolumn\ICturnsONtrue\fi%
  \if@twocolumn\@mindflow@incolumntrue\fi%
}
\def\ResumeIncolumn{\ifICturnsON\@mindflow@incolumntrue\fi}
\newcounter{recordLN}
\newcounter{mfLN}
\setcounter{mfLN}{1}
\newcommand*{\mfSepLine}{% 
  \par\nobreak
  \LocallyStopLineNumbers
  \vspace*{-.5\baselineskip}
  \noindent
  \if@mindflow@incolumn
    \makebox[\linewidth]{\color{mindflowLine}\rule{\linewidth}{mindflowLineHeight}}
  \else
    \hspace*{-\paperwidth}
    \makebox[\linewidth]{\color{mindflowLine}\rule{4\paperwidth}{mindflowLineHeight}}
  \fi
  \par\nobreak
  \ResumeLineNumbers}
\newcommand{\mindflow@makeLineNumber}{% 
  \hss
  \if@mindflow@leftlinenumber
    \normalfont\mindflowNumFont\color{mindflowNum}\LineNumber\hspace{1em}
  \fi
  \color{mindflowMarker}%
  \if@mindflow@leftmarker
    \normalfont\mindflowMarkerFont\mindflowLeft\hspace{1em}
  \fi
  \rlap{\hskip\textwidth}%
  \if@mindflow@rightmarker
    \hspace{1em}\mindflowRight
  \fi
  \if@mindflow@rightlinenumber
    \hspace{1em}
    \normalfont\mindflowNumFont\color{mindflowNum}\LineNumber
  \fi
  \}
\let\mindflowOFF=\comment
\let\endmindflowOFF=\endcomment
\def\mindflowON{%
\postdisplaypenalty=10000
\parskip=0pt
\medskip%
\setcounter{recordLN}{\value{linenumber}}%
\setcounter{linenumber}{\value{mfLN}}%
\AutoIncolumn%
\mfSepLine%
\normalfont\mindflowTextFont\color{mindflowText}%
\linenums%
\let\makeLineNumber\mindflow@makeLineNumber%
\nopagebreak%
}
\def\endmindflowON{%
\nowidow[3]%
\mfSepLine%
\setcounter{mfLN}{\value{linenumber}}%
\setcounter{linenumber}{\value{recordLN}}%
\ResumeIncolumn%
\medskip%
}
\colorlet{mindflowBackground}{white}
\if@mindflow@nonbreakable
\PassOptionsToPackage{many}{tcolorbox}
\RequirePackage{tcolorbox}
\newlength{\mindflow@parindent}
\newlength{\mindflow@parskip}
\newtcolorbox{mindflow@nonbreakable}[1]{
  enhanced jigsaw,
colback=mindflowBackground,colframe=mindflowLine,
leftrule=0pt, rightrule=0pt, sharp corners,
toprule=\mindflowLineHeight, bottomrule=\mindflowLineHeight,
boxsep=0pt, top=.3\baselineskip, bottom=.3\baselineskip,
fontupper=\mindflowTextFont,extras={colupper={mindflowText}},
before upper={
  \setlength{\parindent}{\mindflow@parindent}\
  \setlength{\parskip}{\mindflow@parskip}%,#1
},#1
}
\def\mindflowON{%
\LocallyStopLineNumbers%
\setcounter{recordLN}{\value{linenumber}}%
\setcounter{linenumber}{\value{mfLN}}%
\AutoIncolumn%
\setlength{\mindflow@parindent}{\parindent}%
\setlength{\parskip}{\parskip}%
\if@mindflow@incolumn%
  \begin{mindflow@nonbreakable}{left=0pt,right=0pt}
else%
  \begin{mindflow@nonbreakable}%
    grow to left by=\linewidth,left=\linewidth,
    grow to right by=\linewidth,right=\linewidth
\end{mindflow@nonbreakable}%
\begin{internallinenumbers}%
  \let\makeLineNumber\mindflow@makeLineNumber%
\end{internallinenumbers}%
\def\endmindflowON{%
  \nowidow[3]%
  \end{internallinenumbers}%
  \end{mindflow@nonbreakable}\par%}
\ResumeLineNumbers%
\setcounter{mfLN}{\value{linenumber}}%
\setcounter{linenumber}{\value{recordLN}}%
\ResumeIncolumn%
\fi
\if@mindflow@off
  \let\mindflow=\mindflowOFF
  \let\endmindflow=\endmindflowOFF
\else
  \let\mindflow=\mindflowON
  \let\endmindflow=\endmindflowON
\fi

%%%================================
%%% \mindflowset
%%%================================
\define@key{mindflow}{on}[true]{\csname @mindflow@on#1\endcsname%}
\define@key{mindflow}{off}[true]{\csname @mindflow@off#1\endcsname%}
\define@key{mindflow}{leftmarker}[true]{\csname @mindflow@leftmarker#1\endcsname%}
\define@key{mindflow}{rightmarker}[true]{\csname @mindflow@rightmarker#1\endcsname%}
\define@key{mindflow}{linenumber}[true]{\csname @mindflow@leftlinenumber#1\endcsname%}
\define@key{mindflow}{leftlinenumber}[true]{\csname @mindflow@leftlinenumber#1\endcsname%}
\define@key{mindflow}{rightlinenumber}[true]{\csname @mindflow@rightlinenumber#1\endcsname%}
\define@key{mindflow}{incolumn}{\csname @mindflow@incolumn#1\endcsname}
\define@key{mindflow}{linecolor}{\colorlet{mindflowLine}{#1}}
\define@key{mindflow}{textcolor}{\colorlet{mindflowText}{#1}}
\define@key{mindflow}{numcolor}{\colorlet{mindflowNum}{#1}}
\define@key{mindflow}{markercolor}{\colorlet{mindflowMarker}{#1}}
\define@key{mindflow}{backgroundcolor}{
  \if@mindflow@nonbreakable
    \colorlet{mindflowBackground}{#1}
  \else
    \PackageWarning{mindflow}{The key ‘‘backgroundcolor’’ is only available when the package option\MessageBreak ‘‘nonbreakable’’ is enabled.}
  \fi}
\define@key{mindflow}{textfont}{\renewcommand{\mindflowTextFont}{#1}}
\define@key{mindflow}{numfont}{\renewcommand{\mindflowNumFont}{#1}}
\define@key{mindflow}{markerfont}{\renewcommand{\mindflowMarkerFont}{#1}}
\define@key{mindflow}{left}{\renewcommand{\mindflowLeft}{#1}}
\define@key{mindflow}{right}{\renewcommand{\mindflowRight}{#1}}
\define@key{mindflow}{lineheight}{\setlength{\mindflowLineHeight}{#1}}
\newcommand{\mindflowset}[1]{\setkeys{mindflow}{#1}}
\setkeys{mindflow}{#1}