plain-widow

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Macros for plain TEX by Udo Wermuth

This package contains three output routines that one can use to replace `\plainoutput`. The first adds a reporting of widow, club, and broken lines at a page break to `\plainoutput`. The second avoids widow lines by changing the size of the page by ±1 line. The third tries to avoid widow lines for spreads.

To use one of the three output routines instead of `\plainoutput` load the corresponding file via `\input`; see below. A fourth file allows a user to change the size of the page by ±1 line manually.

1. All files must be loaded before TEX starts the typesetting.
2. All files change the penalties `\postdisplaypenalty`, `\displaywidowpenalty`, `\widowpenalty`, and `\brokenpenalty` compared to `plain.tex`. See section 1 if you want to change them or `\clubpenalty` or `\interlinepenalty`.
3. All files except the one of section 1 must be loaded after `\vsize` is set.
4. All files except the one of section 1 replaces a fixed dimension in `\makefootline` by the macro `\footlinedist`. The distance is increased by 6pt from 24pt to 30pt.
5. Load only one file and load it only once. One can switch between output routines; see below.

For more details see my article in TUGboat **46**:1 (2025), 136–144.

1. File `pxwreport.tex`

The file sets up a reporting of pages with club lines, widow lines, and broken lines, i.e., pages whose last word is hyphenated. The report is given at the end of the run.

To identify the different situations it changes several vertical penalties by a small amount. Compared to `plain.tex` the file sets the following values.

1. `\brokenpenalty` is increased by 1 and becomes 101;
2. `\displaywidowpenalty` is increased by 1 and becomes 51;
3. `\widowpenalty` is increased by 1 and becomes 151;
4. `\postdisplaypenalty` is increased by 2 and becomes 2.

These settings make all combinations unique and the reporting can determine the situation at a page break. Read the comments in `report.tex` if you want to change them or another vertical penalty.

A report contains three lines; for example:

```
Widow lines on the following pages:  5, 17, (23), (25)?, 30.
Club lines on the following pages:  11, 30, 33.
Hyphen at page break on the following pages:  none found.
```

They list the pages with the problematic lines. In the first line a page number in parentheses stands for a display widow line; a '?' after the closing parenthesis signals a possible widow line after a display.

There is one configuration parameter: `\PXprint`. It contains the value 1. If you change this definition, for example, `\def\PXprint{0 }` the report is not shown.

Even if you loaded `pxwreport.tex` the original behavior of `\plainoutput` is established if `\startwithPlain` is called before the typesetting starts.

2. File `pxwsingle.tex`

This file implements an output routine that changes the `\vsize` by ±1 line so that no page contains a club or a widow line. The macros write a line like `SINGLE: \vsize + 1 line` into the log file if they change `\vsize` for a page.

This file loads `pxwreport.tex` of section 1. It introduces the macro `\footlinedist` that contains the value 30pt to replace a fix valued of 24pt in plain's `\makefootline`.

If you change the `\vsize` in the document you must call `\PXstorevsize`. Otherwise the routine will return to the former value of `\vsize`.

The file contains the macro `\startwithReport` that switches back to `pxwreport.tex` if it is called before the first page is output. Otherwise, you can switch between the two output routines with `\fromSingletoReport` and `\fromReporttoSingle`.

In order to see the actions of the output routine the flag `\ifPXshowoutputroutine` can be set true. Then the log file contains the information `OUTPUT: single` in front of the shipped out page number.

3. File `pxwspread.tex`

This file implements an output routine that uses a point system to avoid widow lines, club lines, and broken lines on a spread. It cannot guarantee to eliminate them all, so right hand pages are more important than left hand pages. Moreover, it accepts club lines or broken lines if widow lines can be avoided.

The first page is output using the output routine of section 2.

This file loads `pxwsingle.tex` of section 2 and, thus, it also loads `pxwreport.tex` of section 1. The flag `\ifPXshowoutputroutine` works here too. (You can uncomment a line in the code if you want to see the computed points.) The log file contains message pairs `OUTPUT: (left)` and `(right) spread` in front of the page numbers; a change of the `\vsize` is now reported as, for example, `SPREAD: \vsize - 1 line`.

To switch between output routines you can call `\startwithSingle`, `\fromSpreadtoReport`, `\fromReporttoSpread`, `\fromSingletoSpread`, and `\fromSpreadtoSingle`. Of course, you can also use the switch commands of section 2 if you work with the output routine of section 2, i.e., after you called, for example, `\fromSpreadtoSingle`.

4. File `pxwmanual.tex`

This file loads `pxwreport.tex` and provides its output routine; see section 1. It also contains some code from `pxwsingle.tex` of section 2 and adds new macros to change `\vsize` manually.

For example, after `\def\PXpostoutput{\PXminus(10) \PXplus(14) \PXstop(15)}` pages 10–13 are one line shorter and page 14 is one line longer. You can use `\PXplus`, `\PXminus`, and `\PXstop` several times in the definition or use several definitions in sequence. But only the latest `\PXpostoutput` is active and only pages that are not yet built obey the `\PXplus`, `\PXminus`, and `\PXstop` commands.

The log file states changes of `\vsize` in this way: `MANUAL: \vsize + 1 line`, `MANUAL: \vsize - 1 line`, and `MANUAL: \vsize` (for `\PXstop`).