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## The widows-and-orphans package

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### Abstract

The `widows-and-orphans` package checks page or column breaks for issues with widow or orphan lines and issues warnings if such problems are detected. In addition, it checks and complains about breaks involving hyphenated words and warns about display formulas directly after a page break—if they are allowed by the document parameter settings, which by default isn't the case.

A general discussion of the problem of widows and orphans and suggestions for resolution is given in [1].

### 1 Overview

To determine if a widow or orphan has occurred at a column or page break, the package analyzes the `\outputpenalty` that triggered the break. As  $\TeX$  adds special penalties to widow and orphan lines (`\widowpenalty` and `\clubpenalty`), we can hope to identify them, provided the penalties have unique values so that we don't end up with false positives.

The package therefore analyzes the different parameter values and if necessary adjusts the settings slightly so that all possible combinations that can appear in documents have unique values and can thus be identified.

All that remains is to hook into the output routine check; if `\outputpenalty` has a value that matches one of the problematic cases, issue a warning.

Besides widows and orphans it is possible to detect other cases controlled through penalty parameters, e.g., `\brokenpenalty` that is added if a line ends in a hyphen. So by including this parameter into the checks, we can identify when that happens at the end of a column and issue a warning there too.

We also do this for `\predisdisplaypenalty`, which controls a break just in front of a math display. This is normally set to 10000 so such breaks don't happen in standard  $\LaTeX$ , but if the value is lowered it becomes possible, and thus a possible issue.

#### 1.1 Options

The package has a number of key/value options to adjust its behavior. The option `check` defines what happens when an issue is found: default is `warning`, other possibilities are `error`, `info` and `none`.

The options `orphans` and `widows` set reasonable parameter values; the default is to use whatever the class defines. Possible values are `prevent`, `avoid` or `default`, the latter meaning use standard  $\LaTeX$  defaults.

To set all parameters in one go you can use `prevent-all`, `avoid-all` or `default-all`. These options also assign values to `\brokenpenalty` and `\predisdisplaypenalty`.

#### 1.2 User commands

The package provides three user-level commands.

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`\WaOsetup` `\WaOsetup` *<comma list>*

This command accepts any of the package options and allows adjusting the package behavior in mid-document if necessary.

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`\WaOparameters` `\WaOparameters`

This command produces a listing of the parameter combinations and their values.

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**\WaOignorenext** \WaOignorenext

This command directs the package to not generate warnings for the current page or columns (if we know that they can't be corrected).

**1.3 Related packages**

Package `nowidow`: This package offers some commands to help pushing lines from one page to another by locally requesting no widows or orphans — possibly for several lines. In that respect it implements one of the possibilities discussed in the *TUGboat* article [1]. This is, however, in many cases not the best solution to get rid of a widow or orphan when the interest is to achieve high typographical quality.

**References**

- [1] Frank Mittelbach. Managing forlorn paragraph lines (a.k.a. widows and orphans) in L<sup>A</sup>T<sub>E</sub>X. *TUGboat* 39:3, 2018.
- [2] L<sup>A</sup>T<sub>E</sub>X3 Project Team. A collection of articles on `expl3`.  
<https://latex-project.org/publications/indexbytopic/13-expl3/>

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The italic numbers denote the pages where the corresponding entry is described, numbers underlined point to the definition, all others indicate the places where it is used.

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<https://www.latex-project.org>  
<https://ctan.org/pkg/widows-and-orphans>