

The `scaletextbullet` package

Resize the `\textbullet` without changing its vertical center

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1 Introduction

The `scaletextbullet` package enables the user to resize the `\textbullet` without moving its vertical center, unlike direct usage of the $\text{\LaTeX 2}_{\epsilon}$ and `expl3` commands `\scalebox` and `\box_scale:`. This process is not fully automated — the user must use `\SetTextBulletFactor` to set the `\textbullet` factor to the correct value to display the resized `\textbullet` at the correct height. The `\textbullet` factor is the ratio of the width of the `\textbullet`, excluding its empty space, to its width, including its empty space. One way of estimating the `\textbullet` factor is by using `\scaletextbulletdebug`.

This package provides a solution that works in text mode. For a solution that works only in math mode, see the linked \TeX Stack Exchange thread.¹

2 Commands

This package defines some commands whose argument takes a *floating point expression* or *integer expression*. This syntax has the same representation as the arguments to `\fpeval` and `\inteval`, documented in `usrguide`.²

`\SetTextBulletFactor {<floating point expression>}`

Sets the `\textbullet` factor to the result of computing the *floating point expression*. The `\textbullet` factor is the ratio of the width of the `\textbullet`, excluding its empty space, to its width, including its empty space. This change is local to the current group. The initial `\textbullet` factor is 0.4 — this matches the dimensions of the `\textbullet` of the Latin Modern font at size 10 pt.

`\ScaleTextBullet {<floating point expression>}`

Prints a `\textbullet` with its size scaled by the result of computing the *floating point expression*. The new `\textbullet` will be printed with the same vertical center only if the `\textbullet` factor is set to the correct value.

`\ScaleTextBullets [<floating point expression>] {<integer expression>}`

Prints a number of `\textbullets` equal to the value of *integer expression* with about the same total area as the original `\textbullet`.³ If the optional argument is used, the size of each `\textbullet` is instead scaled by the result

1. <https://tex.stackexchange.com/questions/119319/how-to-correctly-shrink-the-bullets-of-itemize>
2. <https://ctan.org/pkg/usrguide>
3. In calculating the total area, I have approximated each `\textbullet` as a perfect circle, but, of course, the actual shape depends on the font used.

of computing the *floating point expression*. The new `\textbullet` will be printed with the same vertical center only if the `\textbullet` factor is set to the correct value.

`\scaletextbulletdebug`

This command is provided only to help the user estimate the `\textbullet` factor. Prints 15 consecutive `\textbullets` with decreasing sizes. The `\textbullets` are followed by the original `\textbullet` inside a framed box. The framed box has width equal to the `\textbullet` factor \times the total width of the `\textbullet` (this includes its empty space).

The `\textbullet` factor is set to the correct value when the 15 consecutive `\textbullets` have the same vertical center and the `\textbullet` fits nicely inside the framed box.

3 Application

I wrote this package primarily to create nicer-looking itemized lists. The default list labels in L^AT_EX (and other programs) fail to communicate the list level within the list hierarchy:

- | | |
|----------------|----------------|
| • List level 1 | • List level 1 |
| – List level 2 | – List level 2 |
| – List level 2 | * List level 3 |
| * List level 3 | * List level 3 |

This contrasts with traditional enumerated list structures where the list level is obvious from the numbering of the list label:

- | | |
|---------------------|---------------------|
| 1. List level 1 | 2. List level 1 |
| 1.1. List level 2 | 2.1. List level 2 |
| 1.2. List level 2 | 2.1.1. List level 3 |
| 1.2.1. List level 3 | 2.1.2. List level 3 |

This package allows the user to create nice-looking itemized lists using `\ScaleTextBullets`:

- | | |
|------------------|------------------|
| • List level 1 | • List level 1 |
| •• List level 2 | •• List level 2 |
| •• List level 2 | ••• List level 3 |
| ••• List level 3 | ••• List level 3 |

Maybe the visual effect is more clear with different fonts. This example uses STIX Two Text and Source Serif 4, respectively.

- | | |
|------------------|------------------|
| • List level 1 | • List level 1 |
| •• List level 2 | •• List level 2 |
| •• List level 2 | ... List level 3 |
| ... List level 3 | ... List level 3 |
| • List level 1 | • List level 1 |
| •• List level 2 | •• List level 2 |
| •• List level 2 | ... List level 3 |
| ... List level 3 | ... List level 3 |

4 Implementation notes

The procedure of resizing the `\textbullet` without changing its vertical center, including the definition of the `\textbullet` factor, makes an important assumption: That the `\textbullet` is a perfect circle. Of course, this is not completely accurate and the actual shape depends on the font used. This means that the `\textbullet` factor may not be exactly the ratio of the width of the `\textbullet`, excluding its empty space, to its width, including its empty space.

In writing this package, I have referenced a comment on the `TEX` Stack Exchange by the user egreg.⁴ This package uses the same procedure for resizing the `\textbullet` without changing its vertical center.

5 Programming

This package is written in `expl3`, but does not provide any public functions or variables.

4. <https://tex.stackexchange.com/questions/620507/how-to-resize-textbullet-without-the-bullet-moving-down/638599#638599>