

# The `scaletextbullet` package

Resize the `\textbullet` without changing its vertical center

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## 1 Introduction

### 1.1 About

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 only in text mode. For a solution that works only in math mode, see the linked  $\text{\TeX}$  Stack Exchange thread.<sup>1</sup>

### 1.2 Loading the package

Requirements:

- $\text{\LaTeX 2}_{\epsilon}$  version 2023-11-01 or newer
- `l3kernel` version 2023-11-01 or newer

### 1.3 Syntax

This documentation uses the syntaxes `\langle floating point expression \rangle` and `\langle integer expression \rangle`. These syntaxes have the same meaning as the arguments to `\fpeval` and `\inteval`, respectively, which are documented in `usrguide`.

## 2 Commands

```
\settextbulletfactor {\langle floating point expression \rangle}
```

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

1. <https://tex.stackexchange.com/questions/119319/how-to-correctly-shrink-the-bullets-of-itemize>

```
\scaletextbullet {\langle floating point expression \rangle}
```

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

Some exceptions:

- Issues an error if the result of evaluating the `\langle floating point expression \rangle` is a negative number.
- Issues a warning if the new `\textbullet` would have zero dimensions.
- Cannot be used in math mode.

```
\scaletextbullets [\langle floating point expression \rangle] {\langle integer expression \rangle}
```

Prints a number of `\textbullets` equal to the result of evaluating the `\langle integer expression \rangle` with about the same total area as the original `\textbullet`.<sup>2</sup> Adding the optional argument instead scales the size of each `\textbullet` by a factor equal to the result of evaluating the `\langle floating point expression \rangle`. The new `\textbullet` will be printed with the same vertical center only if the `\textbullet` factor is set to the correct value.

Some exceptions:

- Issues an error if the result of evaluating the `\langle integer expression \rangle` or `\langle floating point expression \rangle` is a negative number.
- Issues a warning if no `\textbullets` would be printed.
- Issues a warning if the new `\textbullet` would have zero dimensions.
- Cannot be used in math mode.

```
\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. Cannot be used in math mode.

### 3 Application

I wrote this package primarily to create nicer-looking itemized lists. The default list labels in L<sup>A</sup>T<sub>E</sub>X (and other programs) fail to communicate the list level within the list hierarchy:

2. 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.

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• List level 1 <ul style="list-style-type: none"> <li>– List level 2</li> <li>– List level 2 <ul style="list-style-type: none"> <li>* List level 3</li> </ul> </li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• List level 1 <ul style="list-style-type: none"> <li>– List level 2 <ul style="list-style-type: none"> <li>* List level 3</li> <li>* List level 3</li> </ul> </li> </ul> </li> </ul> |
|--|--|

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

- |  |  |
|--|--|
| <ol style="list-style-type: none"> <li>1. List level 1 <ol style="list-style-type: none"> <li>1.1. List level 2</li> <li>1.2. List level 2 <ol style="list-style-type: none"> <li>1.2.1. List level 3</li> </ol> </li> </ol> </li> </ol> | <ol style="list-style-type: none"> <li>2. List level 1 <ol style="list-style-type: none"> <li>2.1. List level 2 <ol style="list-style-type: none"> <li>2.1.1. List level 3</li> <li>2.1.2. List level 3</li> </ol> </li> </ol> </li> </ol> |
|--|--|

This package allows the user to create nice-looking itemized lists using `\scaletextbullets` where the number of scaled `\textbullet`s in the list label indicates the list level:

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• List level 1 <ul style="list-style-type: none"> <li>•• List level 2</li> <li>•• List level 2 <ul style="list-style-type: none"> <li>••• List level 3</li> </ul> </li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• List level 1 <ul style="list-style-type: none"> <li>•• List level 2 <ul style="list-style-type: none"> <li>••• List level 3</li> <li>••• List level 3</li> </ul> </li> </ul> </li> </ul> |
|--|---|

The visual effect may be more clear with different fonts. This example uses STIX Two Text and Source Serif 4, respectively.

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• List level 1 <ul style="list-style-type: none"> <li>•• List level 2</li> <li>•• List level 2 <ul style="list-style-type: none"> <li>••• List level 3</li> </ul> </li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• List level 1 <ul style="list-style-type: none"> <li>•• List level 2 <ul style="list-style-type: none"> <li>••• List level 3</li> <li>••• List level 3</li> </ul> </li> </ul> </li> </ul> |
| <ul style="list-style-type: none"> <li>• List level 1 <ul style="list-style-type: none"> <li>•• List level 2</li> <li>•• List level 2 <ul style="list-style-type: none"> <li>••• List level 3</li> </ul> </li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• List level 1 <ul style="list-style-type: none"> <li>•• List level 2 <ul style="list-style-type: none"> <li>••• List level 3</li> <li>••• List level 3</li> </ul> </li> </ul> </li> </ul> |

## 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 T<sub>E</sub>X Stack Exchange by the user egreg.<sup>3</sup> This package uses the same procedure for resizing the `\textbullet` without changing its vertical center.

3. <https://tex.stackexchange.com/questions/620507/how-to-resize-tex-tbullet-without-the-bullet-moving-down>