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 LaTeX 2_ε 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 `\textbullet`s with decreasing sizes. The `\textbullet`s are followed by the original `\textbullet` inside a framed box. The framed box has width equal to the `\textbullet` factor × the total width of the `\textbullet` (this includes its empty space).

The `\textbullet` factor is set to the correct value when the 15 consecutive `\textbullet`s 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 LaTeX (and other programs) fail to communicate the list level within the list hierarchy:

- List level 1
  - List level 2
  - List level 2
    - List level 3

- List level 1
  - List level 2
    - 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
   1.1. List level 2
   1.2. List level 2
      1.2.1. List level 3

2. List level 1
   2.1. List level 2
      2.1.1. 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 2
  - List level 2
    - List level 3

- List level 1
  - List level 2
    - 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 2
  - List level 2
    - List level 3

- List level 1
  - List level 2
    - List level 3
    - List level 3

- List level 1
  - List level 2
  - List level 2
    - List level 3

- List level 1
  - List level 2
    - 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`