The **scaletextbullet** package

Resize the \textbullet without changing its vertical center

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Version 2.0.0   11 February 2025

1   Loading the package

```
% LaTeX2e version 2023-11-01 added \IfExplAtLeastTF.
\NeedsTeXFormat{LaTeX2e}[2023-11-01]
\ProvidesExplPackage
  {scaletextbullet}
  {2025-02-11}
  {2.0.0}
  {Resize the \noexpand\textbullet without changing its vertical center.}


% l3kernel version 2023-10-10 added many 'e'-variants.
\IfExplAtLeastTF { 2023-10-10 } { } { }
  {
    \msg_new:nnn { scaletextbullet } { l3kernel-out-of-date }
      {
        The~ scaletextbullet~ package~ could~ not~ load. \\
        This~ package~ requires~
        L3~ programming~ layer~ version~ 2023-10-10~ or~ later.
      }
    \msg_critical:nn { scaletextbullet } { l3kernel-out-of-date }
  }
```

2   Messages

```
% \textbullet is invalid in math mode.
\msg_new:nnn { scaletextbullet } { math-mode-error }
  { '#1'~ cannot~ be~ used~ in~ math~ mode~ \msg_line_context:. }
\msg_new:nnn { scaletextbullet } { factor-out-of-bounds }
  { Invalid~ \iow_char:N \\textbullet~ factor~ '#1'~ \msg_line_context:. }
\msg_new:nnn { scaletextbullet } { scale-out-of-bounds }
  { Invalid~ scale~ factor~ '#1'~ \msg_line_context:. }
\msg_new:nnn { scaletextbullet } { count-out-of-bounds }
  { Invalid~ number~ of~ \iow_char:N \\textbullet~ '#1'~ \msg_line_context:. }
```

3   Some variables

```
% The \textbullet factor
\fp_new:N \l__scaletextbullet_factor_fp
```

```
\fp_set:Nn \l__scaletextbullet_factor_fp { 0.4 }

% Used only to speed up floating point calculations.
\fp_const:Nn \c__scaletextbullet_one_half_fp { 0.5 }
\fp_const:Nn \c__scaletextbullet_scaletextbullets_two_fp   { 2 ^ -0.5 }
\fp_const:Nn \c__scaletextbullet_scaletextbullets_three_fp { 3 ^ -0.5 }

% Scratch variables
\int_new:N \l__scaletextbullet_tmp_int
\fp_new:N  \l__scaletextbullet_tmp_fp
\box_new:N \l__scaletextbullet_tmp_box
```

4 Auxiliary function

```
% Lowers the \textbullet to the baseline, scales it by a factor of #2, and
% then raises it back to the vertical center.
% I have referenced code by the great egreg:
% https://tex.stackexchange.com/questions/620507/how-to-resize-textbullet-
without-the-bullet-moving-down
\dim_new:N \l__scaletextbullet_bottom_dim % bottom of \textbullet
\dim_new:N \l__scaletextbullet_center_dim % center of \textbullet
\cs_new_protected:Npn \__scaletextbullet_box_scale:Nn #1#2
  {
    \hbox_set:Nn #1 { \textbullet }
    \dim_set:Nn \l__scaletextbullet_bottom_dim
      {
        \box_ht:N #1 -
        \fp_to_dim:n
          { \l__scaletextbullet_factor_fp * \dim_to_fp:n { \box_wd:N #1 } } }
      }
    \dim_set:Nn \l__scaletextbullet_center_dim
      {
        \fp_to_dim:n
          {
            \dim_to_fp:n { \box_ht:N #1 + \l__scaletextbullet_bottom_dim } *
            \c__scaletextbullet_one_half_fp
          }
      }
    \hbox_set:Nn #1
      {
        \box_move_down:nn { \l__scaletextbullet_bottom_dim } { \box_use:N #1 }
      }
    \box_scale:Nnn #1 {#2} {#2}
    \hbox_set:Nn #1
      {
        \box_move_up:nn
          {
```

```
            \l__scaletextbullet_center_dim -
            \fp_to_dim:n
              {
                \dim_to_fp:n { \box_ht:N #1 } * \c__scaletextbullet_one_half_fp
              }
          }
          { \box_use:N #1 }
      }
  }
```

5 Document commands

```
\NewDocumentCommand \settextbulletfactor { m }
  { \__scaletextbullet_set_factor:n {#1} }
\cs_new_protected:Npn \__scaletextbullet_set_factor:n #1
  {
    \fp_set:Nn \l__scaletextbullet_factor_fp {#1}
    \fp_compare:nF { \c_zero_fp < \l__scaletextbullet_factor_fp <= \c_one_fp }
      {
        \msg_error:nne { scaletextbullet } { factor-out-of-bounds }
          { \fp_use:N \l__scaletextbullet_factor_fp }
      }
  }


\NewDocumentCommand \scaletextbullet { m }
  {
    \mode_leave_vertical:
    \mode_if_math:TF
      {
        \msg_error:nne { scaletextbullet } { math-mode-error }
          { \token_to_str:N \scaletextbullet }
      }
      { \__scaletextbullet_scaletextbullet:n {#1} }
  }
\cs_new_protected:Npn \__scaletextbullet_scaletextbullet:n #1
  {
    \fp_set:Nn \l__scaletextbullet_tmp_fp {#1}
    \fp_compare:nNnTF \l__scaletextbullet_tmp_fp > \c_zero_fp
      {
        \__scaletextbullet_box_scale:Nn \l__scaletextbullet_tmp_box
          { \l__scaletextbullet_tmp_fp }
        \box_use:N \l__scaletextbullet_tmp_box
      }
      {
        \fp_compare:nNnF \l__scaletextbullet_tmp_fp = \c_zero_fp
          {
            \msg_error:nne { scaletextbullet } { scale-out-of-bounds }
```

```
            { \fp_use:N \l__scaletextbullet_tmp_fp }
          }
      }
  }


\NewDocumentCommand \scaletextbullets { o m }
  {
    \mode_leave_vertical:
    \mode_if_math:TF
      {
        \msg_error:nne { scaletextbullet } { math-mode-error }
          { \token_to_str:N \scaletextbullets }
      }
      {
        \IfNoValueTF {#1}
          { \__scaletextbullet_scaletextbullets:n {#2} }
          { \__scaletextbullet_scaletextbullets:nn {#1} {#2} }
      }
  }
\cs_new_protected:Npn \__scaletextbullet_scaletextbullets:n #1
  {
    \int_set:Nn \l__scaletextbullet_tmp_int {#1}
    \int_compare:nNnTF \l__scaletextbullet_tmp_int > 0
      {
        \int_case:nnF { \l__scaletextbullet_tmp_int }
          {
            { 1 }
            { \fp_set_eq:NN \l__scaletextbullet_tmp_fp \c_one_fp }
            { 2 }
            {
              \fp_set_eq:NN \l__scaletextbullet_tmp_fp
                \c__scaletextbullet_scaletextbullets_two_fp
            }
            { 3 }
            {
              \fp_set_eq:NN \l__scaletextbullet_tmp_fp
                \c__scaletextbullet_scaletextbullets_three_fp
            }
            { 4 }
            {
              \fp_set_eq:NN \l__scaletextbullet_tmp_fp
                \c__scaletextbullet_one_half_fp
            }
          }
          {
            \fp_set:Nn \l__scaletextbullet_tmp_fp
              { \int_use:N \l__scaletextbullet_tmp_int ^ -0.5 }
          }
        \__scaletextbullet_box_scale:Nn \l__scaletextbullet_tmp_box
```

```
              { \l__scaletextbullet_tmp_fp }
            \prg_replicate:nn { \l__scaletextbullet_tmp_int }
              { \box_use:N \l__scaletextbullet_tmp_box }
          }
          {
            \int_if_zero:nF { \l__scaletextbullet_tmp_int }
              {
                \msg_error:nnV { scaletextbullet } { count-out-of-bounds }
                  \l__scaletextbullet_tmp_int
              }
          }
      }
    \cs_new_protected:Npn \__scaletextbullet_scaletextbullets:nn #1#2
      {
        \fp_set:Nn \l__scaletextbullet_tmp_fp {#1}
        \fp_compare:nNnTF \l__scaletextbullet_tmp_fp > \c_zero_fp
          {
            \int_set:Nn \l__scaletextbullet_tmp_int {#2}
            \int_compare:nNnTF \l__scaletextbullet_tmp_int > 0
              {
                \__scaletextbullet_box_scale:Nn \l__scaletextbullet_tmp_box
                  { \l__scaletextbullet_tmp_fp }
                \prg_replicate:nn { \l__scaletextbullet_tmp_int }
                  { \box_use:N \l__scaletextbullet_tmp_box }
              }
              {
                \int_if_zero:nF { \l__scaletextbullet_tmp_int }
                  {
                    \msg_error:nnV { scaletextbullet } { count-out-of-bounds }
                      \l__scaletextbullet_tmp_int
                  }
              }
          }
          {
            \fp_compare:nNnF \l__scaletextbullet_tmp_fp = \c_zero_fp
              {
                \msg_error:nne { scaletextbullet } { scale-out-of-bounds }
                  { \fp_use:N \l__scaletextbullet_tmp_fp }
              }
          }
      }


\NewDocumentCommand \scaletextbulletdebug { }
  {
    \mode_leave_vertical:
    \mode_if_math:TF
      {
        \msg_error:nne { scaletextbullet } { math-mode-error }
          { \token_to_str:N \scaletextbulletdebug }
```

```
      }
      { \__scaletextbullet_debug: }
  }
% I have referenced code by the great egreg:
% https://tex.stackexchange.com/questions/620507/how-to-resize-textbullet-
without-the-bullet-moving-down
\cs_new_protected:Npn \__scaletextbullet_debug:
  {
    \int_step_inline:nn { 15 }
      {
        \fp_set:Nn \l__scaletextbullet_tmp_fp { ##1 ^ -0.5 }
        \__scaletextbullet_box_scale:Nn \l__scaletextbullet_tmp_box
          { \l__scaletextbullet_tmp_fp }
        \box_use:N \l__scaletextbullet_tmp_box
      }
    \,
    \group_begin:
      \dim_set:Nn \fboxrule { 0.1pt }
      \dim_zero:N \fboxsep
      \framebox
        [
          \fp_to_dim:n
            { \l__scaletextbullet_factor_fp * \dim_to_fp:n { \width } } }
        ]
        { \textbullet }
    \group_end:
  }
```