

The `scaletextbullet` package

Resize the `\textbullet` without changing its vertical center

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Version 1.1.1 6 February 2025

1 Loading the package

```
% LaTeX2e version 2023-11-01 added \IfExplAtLeastTF.
\NeedsTeXFormat{LaTeX2e}[2023-11-01]
\ProvidesExplPackage
  {scaletextbullet}
  {2025-02-06}
  {1.1.1}
  {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  \msg_new:nnn { scaletextbullet } { l3kernel-out-of-date }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  \msg_critical:nm { scaletextbullet } { l3kernel-out-of-date }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 }
  }
}

```

```

    }
    { \l__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 \l__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:
}

```