`luwa-ul` Package Documentation

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目次

1　設置（Installation）

インストール方法は、適切な箇所に `luwa-ul.sty` を配置し、`\usepackage{luwa-ul}`と書き込むだけで完了です。オプションはありません。（Place `luwa-ul.sty` in a directory where LaTeX can find it.）

依存性についてです。（Dependencies: ）

- ・luacolor, xcolor
- ・lua-ul
- ・calc, tikz

を内部的に仕様しています。（This package uses them internally.）

2　注意（Caution）

このパッケージはその実装の上で Lua 言語を仕様しているので、LuaLaTeX の上でのみ仕様できるパッケージとなっています。（This package internally uses Lua, so it can be compiled only by LuaLaTeX.）

3　提供されるコマンド（Commands）

提供されるコマンドは以下の通りです。要望に応じて追加されることもありえます。（The provided commands are as follows. I would add some more commands upon requests.）

1.Manual

- ・\underLineKK, \overLineKK
- ・\nijyusen, \keshinijyusen
- ・\thinHighLight, \thickHighLight
- ・\tenKK, \dashKK, \namiKK
- ・\LineNumbering

2.Auto

- ・\underLineKKAuto, \overLineKKAuto
- ・\nijyusenAuto
- ・\tenKKAuto, \dashKKAuto, \namiKKAuto

3.1　\underLineKK

このコマンドは、`lua-ul` パッケージによって提供される\underLine コマンドに対し、

・縦書き時のずれの解消
・ルビがあった際の挙動の変化

の2点において調整を施したものとなっています。

(This command is basically made out of \underLine command, which is provided by lua-ul package. I added some adjustments on it in order to

・eliminate the misalignment in vertical writing mode.
・change its behavior when the argument includes phonetic guides.

)

使い方は以下のようになります。(You can use it as follows:)

```
Input
1   \underLineKK[color=色，bottom=下線最下部の位置のずれ，heigth=下線の太さ（bottom
    の位置からの距離で計算）]{引数}
2
3   \underLineKK[color=red]{あああああああああ}
4   \underLineKK[bottom=.1em]{あああああああああ}
5
6   \parbox<t>[c][6cm][c]{3cm}{%
7     \underLineKK{ああ\ruby{あ}{あ}あああああ}
8   }
```

```
Output
横書き：
ああああ^aああああああああああああああああああ
縦書き：
```



```
a　あ
```

3.2 \overLineKK

　このコマンドは\underLineKK を使用しても作成が可能ですが、ショートカットとして用意しておき
ました。このコマンドは縦書き環境においては通常の\underLineKK につけてあったルビ補正を抜い
てあります。(This command can also be created using \underLineKK, but it has been provided as
a shortcut. In a vertical writing environment, this command omits the ruby adjustment that was
included in the standard \underLineKK.)

```
Input

1   \overLineKK[color=色]{引数}

2

3   \overLineKK[color=red]{あああああああああ}

4

5   \parbox<t>[c][6cm][c]{3cm}{%

6     \overLineKK{ああ\ruby{あ}{あ}あああああ}

7   }
```

```
Output

横書き：
ああああああああ
縦書き：
            あ
            あ
            あ ぁ
            あ
            あ
            あ
            あ
            あ
```

3.3 \nijyusen, \keshinijyusen

　これらのコマンドは\underLineKK を入れ子にすることでも作成が可能ですが、keshinijyusen に
関してはルビの有無による補正をなくしてあります。(These commands can also be created by
nesting \underLineKK, but for keshinijyusen, the adjustment for the presence or absence of ruby
has been removed.)

```
Input

1   \nijyusen[color=色，bottom=下線最下部の位置のずれ]{引数}
```

```
2    \keshinijyusen[color=色]{引数}
3
4    \nijyusen[color=red]{あああああああああ}
5    \keshinijyusen{あああああああ}
6
7    \parbox<t>[c][6cm][c]{3cm}{%
8      \nijyusen[color=red]{ああ\ruby{あ}{あ}あああああ}
9      \keshinijyusen{ああ\ruby{あ}{あ}あああああ}
10     \nijyusen[color=red]{あああああああ}
11     \keshinijyusen{あああああああ}
12   }
```

Output

横書き：
あああああああああああああああああああ
縦書き：

3.4 \thinHighLight, \thickHighLight

　これらは蛍光ペンを引いたような出力を提供するコマンドです。ルビの有無に対する挙動が \underLineKK のそれとは少々異なり、単なる並行移動だけではなく線の太さ自体も追随して動くという仕様にしてあります。(These are commands that provide an output resembling a highlight made with a fluorescent marker. Their behavior regarding the presence or absence of ruby differs slightly from that of \underLineKK, as they are designed not only to shift position but also to have the line thickness itself adjust accordingly.)

Input

```
1    \thinHighLight[color=色]{引数}
2    \thickHighLight[color=色]{引数}
3
4    \thinHighLight{あああああああああ}
```

```
5  \thickHighLight[color=green]{あああああああああ}

6

7  \parbox<t>[c][6cm][c]{3cm}{%
8    \thinHighLight{あああ\ruby{あ}{あ}あああああ}
9    \thickHighLight[color=green]{ああ\ruby{あ}{あ}ああああああ}
10   \thinHighLight{あああああああああ}
11   \thickHighLight[color=green]{あああああああああ}
12  }
```

Output

横書き：
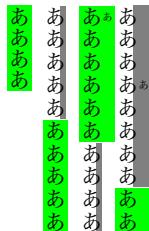
ああああああああああ<mark>あああああああああ</mark>

縦書き：

3.5 \namiKK

このコマンドは波線を引くコマンドを提供します。ルビに対する挙動は\underLineKK のそれに同じです。（This command provides a wavy underline. Its behavior with respect to ruby is the same as that of \underLineKK.）

Input

```
1  \namiKK[bottom=下線最下部の位置のずれ]{引数}

2

3  \namiKK[bottom=.3em]{あああああああああ}

4

5  \parbox<t>[c][6cm][c]{3cm}{%
6    \namiKK{あああ\ruby{あ}{あ}あああああ}
7    \namiKK[bottom=.3em]{あああああああああ}
8  }
```

横書き：

ああああああああああああああああああああ

縦書き：

あああああああああ　ああああああああああ

3.6 \tenKK, \dashKK

これらはそれぞれ、点線、破線を提供します。ルビに対する挙動は\underLineKK のそれに同じです。(These commands provide dotted and dashed underlines, respectively. Their behavior toward ruby text is the same as that of \underLineKK.)

```
1  \tenKK[bottom=下線最下部の位置のずれ，radius=ドットの半径，distance=ドット間距離
   ]{引数}
2  % デフォルト：radius=.1ex, distance=.4ex
3  \dashKK[bottom=下線最下部の位置のずれ，width=破線の太さ，distance=破線間距離，
   length=破線の長さ]{引数}
4  % デフォルト：width=.2pt, distance=.3ex, length=.4ex
5
6  \tenKK{あああああああああ}
7  \tenKK[radius=.05ex, distance=.3ex]{あああああああああ}
8  \dashKK{あああああああああ}
9  \dashKK[length=.01ex, distance=.1ex]{あああああああああ}
10
11 \parbox<t>[c][6cm][c]{3cm}{%
12   \tenKK{ああああ\ruby{あ}{あ}ああ}
13   \tenKK[radius=.05ex, distance=.3ex]{あああああああああ}
14   \dashKK{ああああ\ruby{あ}{あ}ああ}
15   \dashKK[length=.01ex, distance=.1ex]{あああああああああ}
16 }
```

横書き：

ああ

縦書き：

3.7 \LineNumbering

下線に番号を振るためのコマンドです。これは私が作成した `KKsymbols` パッケージ（TeX Live に収録済み）との併用をお勧めしています。スターオプションを付与すると、縦書きの時には引数の中身が回転します[1]。(This command assigns numbers to underlines. It is recommended to use it together with my `KKsymbols` package (already included in TeX Live). When the starred option is given, the contents of the argument are rotated in vertical writing[2].)
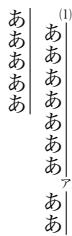
```
1  \LineNumbering{\kakko{1}}\underLineKK{あああああああ}
2
3  \parbox<t>[c][6cm][c]{3cm}{%
4    \LineNumbering{\kakko{1}}\underLineKK{あああああああ}
5    \LineNumbering*{ア}\underLineKK{あああああああ}
6  }
```

横書き：

(1) あああああああ

縦書き：

---

[1] 横書きの時には出力に変化はありません。

[2] In horizontal writing, the output remains unchanged.

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3.8 自動調節シリーズ（Auto Series）

　このシリーズは、v1.1.0 にて追加された新たなモデルで、主に積分記号などの大きな記号が引数内部に含まれる場合に威力を発揮するコマンド群です。（These commands are added on v1.1.0 update. When you include \int or so in the argument, the difference between Manual Series and Auto Series are critcal.）通常の Manual Series との違いは（You can see how defferent they are as follows:）

```
1   \underLineKK{$\displaystyle \int_{a}^{b} f(x) \, dx$}
2   \underLineKKAuto{$\displaystyle \int_{a}^{b} f(x) \, dx$}
3
4   \namiKK{$\displaystyle \int_{a}^{b} f(x) \, dx$}
5   \namiKKAuto{$\displaystyle \int_{a}^{b} f(x) \, dx$}
6
7   \[\underLineKK{\int_{a}^{b} f(x) \, dx}\]
8   \[\underLineKKAuto{\int_{a}^{b} f(x) \, dx}\]
9   \[\namiKK{\int_{a}^{b} f(x) \, dx}\]
10  \[\namiKKAuto{\int_{a}^{b} f(x) \, dx}\]
```

Output

横書き：

$$\underline{\int_{a}^{b} f(x)\, dx} \qquad \frac{\int_{a}^{b} f(x)\, dx}{}$$

$$\underwave{\int_{a}^{b} f(x)\, dx} \qquad \underwave{\int_{a}^{b} f(x)\, dx}$$

$$\int_{a}^{b} f(x)\, dx$$

$$\underline{\int_a^b f(x)\,dx}$$

$$\underwave{\int_a^b f(x)\,dx}$$

$$\underwave{\int_a^b f(x)\,dx}$$

縦書き：

$$\int_a^b f(x)\,dx \quad \int_a^b f(x)\,dx \quad \int_a^b f(x)\,dx \quad \int_a^b f(x)\,dx \quad \int_a^b f(x)\,dx \quad \int_a^b f(x)\,dx$$

以上の比較を参照すると一目瞭然でしょう。

　使い分けについてですが、基本的には Manual Series を使用してください。なぜなら Auto Series は、引数の中に一箇所でも極端に深さをとるコマンドが存在した場合、改行後もずっとその調整のまま線を引き続けてしまいます。したがって、パラグラフの大部分にアンダーラインを入れたいというような場合には不向きです。(Regarding the choice of which series to use, please use the Manual Series by default. This is because the Auto Series continues to draw lines with the same vertical adjustment if there is even a single command within its argument that takes an unusually deep depth. Therefore, it is not suitable for cases where you want to underline a large portion of a paragraph.)

　例えば、(For example,)

```
以上より、
\[f(x)=\namiKKAuto{\frac{x+\frac{a}{b}}{x^4+\frac{c}{d}}} \ \text{……\kakko{答}}\]
\noindent となります。
```

以上のような局面においては、数式に下線が被ると格好が悪いため、Auto Series の使い所であると言えます。(in such situations, it would look awkward if the underline overlapped with mathematical expressions, so this is where the Auto Series becomes useful.)

4 ライセンス (License)

Released under the LaTeX Project Public License (LPPL) 1.3c.

5 Version History

- ・**v1.0.1 (2025/10/26)** --- Initial public release.
- ・**v1.1.0 (2025/10/29)** --- I added Auto Series, and changed some csname of commands.
- ・**v1.1.1 (2025/11/10)** --- Slightly adjusted the move of Auto Series.

6 Source Code

```
\NeedsTeXFormat{LaTeX2e}
\ProvidesPackage{luwa-ul}[2025/11/10, Version 1.1.1]

\RequirePackage{luacolor, lua-ul, calc, tikz}
\RequirePackage[dvipsnames, svgnames, x11names]{xcolor}
\definecolor{mygray@luwa-ul}{RGB}{60, 60, 60}

\newlength{\underLine@KK@Adjust@tmp}
\newlength{\KKUL@bottom}
\newlength{\KKUL@height}

\NewDocumentCommand{\underLine@KK@Adjust@bottom}{m}{%
  \setlength{\underLine@KK@Adjust@tmp}{\f@size pt}%
  \ifnum\ltjgetparameter{direction}=3%
    \def\underLine@KK@Adjust@use@bottom{\dimexpr -#1+\underLine@KK@Adjust@tmp/2\relax}%
  \else%
    \def\underLine@KK@Adjust@use@bottom{\dimexpr #1-\underLine@KK@Adjust@tmp/7\relax}%
  \fi%
}
```

```
\NewDocumentCommand{\underLine@KK@Adjust@height}{m}{%
  \ifnum\ltjgetparameter{direction}=3%
    \def\underLine@KK@Adjust@use@height{#1}%
  \else%
    \def\underLine@KK@Adjust@use@height{#1}%
  \fi%
}

\define@key{KKUL}{bottom}{%
  \underLine@KK@Adjust@bottom{#1}%
  \setlength{\KKUL@bottom}{\underLine@KK@Adjust@use@bottom}%
}

\define@key{KKUL}{height}{%
  \underLine@KK@Adjust@height{#1}%
  \setlength{\KKUL@height}{\underLine@KK@Adjust@use@height}%
}

\define@key{KKUL}{color}{%
  \def\KKUL@color{#1}%
}

% ルビが中に入っているときだけテキストを上昇させる
\newlength{\KKUL@rubyraise}
\directlua{
  function RubyFlagKKUL(t)
    if string.find(t, "\\ruby") or string.find(t, "\\kenten") or string.find(t, "\\送り") or
        string.find(t, "\\振り") then
      tex.print("1")
    else
      tex.print("0")
    end
  end
}


% 追記（2025/10/29）
% Auto Depth Adjust System
\newlength{\temp@depth@kk}
\NewDocumentCommand{\getdepth@kk}{m}{%
  \ifnum\ltjgetparameter{direction}=3%
    \settoheight{\temp@depth@kk}{#1}%
    \addtolength{\temp@depth@kk}{-.5em}%
    \setlength{\temp@depth@kk}{-\temp@depth@kk}%
  \else%
    \settodepth{\temp@depth@kk}{#1}%
    \addtolength{\temp@depth@kk}{-.12\zw}% 2025/11/10加筆修正
  \fi%
}
\NewDocumentCommand{\underLineKK@plain}{ O{} +m }{% 内部調整用
```

```
  \underLine@KK@Adjust@bottom{-.1em}%
  \underLine@KK@Adjust@height{0.3pt}%
  \setlength{\KKUL@bottom}{\underLine@KK@Adjust@use@bottom}%
  \setlength{\KKUL@height}{\underLine@KK@Adjust@use@height}%
  \def\KKUL@color{black}%
  \def\underLineKK@test@contents{#2}%
  \setkeys{KKUL}{#1}%
  \underLine[bottom=\KKUL@bottom, height=\KKUL@height, color=\KKUL@color]{#2}%
}

% ルビ以外のはみだしを許容する（見出しなどで見た目を損なわないためなど）
\NewDocumentCommand{\underLineKK}{ O{} +m }{%
  \underLine@KK@Adjust@bottom{-.1em}%
  \underLine@KK@Adjust@height{0.3pt}%
  \setlength{\KKUL@bottom}{\underLine@KK@Adjust@use@bottom}%
  \setlength{\KKUL@height}{\underLine@KK@Adjust@use@height}%
  \def\KKUL@color{black}%
  \def\underLineKK@test@contents{#2}%
  \setkeys{KKUL}{#1}%
  \edef\UL@rubyflag{\numexpr\directlua{RubyFlagKKUL("\luaescapestring{\unexpanded\expandafter
      {\underLineKK@test@contents}}")}\relax}%
  \ifnum\ltjgetparameter{direction}=3%
    \ifnum\UL@rubyflag=1%
      \setlength{\KKUL@rubyraise}{.5em}%
    \else%
      \setlength{\KKUL@rubyraise}{0em}%
    \fi%
  \else%
    \setlength{\KKUL@rubyraise}{0em}%
  \fi%
  \underLine[bottom=\KKUL@bottom+\KKUL@rubyraise, height=\KKUL@height, color=\KKUL@color]{#2}%
}


% 深さに応じて変わるタイプ
\NewDocumentCommand{\underLineKKAuto@make}{ O{} +m }{%
  \underLine@KK@Adjust@bottom{-.1em}%
  \underLine@KK@Adjust@height{0.3pt}%
  \setlength{\temp@depth@kk}{0pt}%
  \setlength{\KKUL@bottom}{\underLine@KK@Adjust@use@bottom}%
  \setlength{\KKUL@height}{\underLine@KK@Adjust@use@height}%
  \def\KKUL@color{black}%
  \def\underLineKK@test@contents{#2}%
  \setkeys{KKUL}{#1}%
  \getdepth@kk{\underLineKK@test@contents}%
  \underLine[bottom=\KKUL@bottom-\temp@depth@kk, height=\KKUL@height, color=\KKUL@color]{#2}%
}
\NewDocumentCommand{\underLineKKAuto}{ O{} +m }{%
  \ifmmode
    \mathchoice
```

```
    {\mbox{\underLineKKAuto@make[#1]{$\displaystyle #2$}}} % displaystyle
    {\mbox{\underLineKKAuto@make[#1]{$#2$}}}        % textstyle (inline)
    {\mbox{\underLineKKAuto@make[#1]{$#2$}}}        % scriptstyle
    {\mbox{\underLineKKAuto@make[#1]{$#2$}}}        % scriptscriptstyle
  \else
    \underLineKKAuto@make[#1]{#2}% テキストモードではそのまま出力（mboxで包まない）
  \fi
}
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%


%lua-ulで作ったnamiKK（元の名称はsnamiftだが、変更）%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
\newlength{\snamift@bottom}\setlength{\snamift@bottom}{0ex}
\define@key{snamift}{bottom}{%
  \setlength{\snamift@bottom}{#1}%
}

% 名称変更用のカウンター（グローバル変数）
\newcount\snamift@id

\NewDocumentCommand{\namiKK}{ O{} +m }{%
  % 1：キーを先にセットして \snamift@bottom を更新
  \setlength{\snamift@bottom}{0ex}%
  \def\snamift@test@contents{#2}%
  \setkeys{snamift}{#1}%
  \edef\UL@rubyflag{\numexpr\directlua{RubyFlagKKUL("\luaescapestring{\unexpanded\expandafter
      {\snamift@test@contents}}")}\relax}%
  \ifnum\ltjgetparameter{direction}=3%
    \ifnum\UL@rubyflag=1%
      \addtolength{\snamift@bottom}{.5em}%
    \fi%
  \fi%
  % 2：IDを進める
  \global\advance\snamift@id by 1\relax%
  % 3：ユニーク名で下線タイプを定義（正しく展開されるように \expandafter と \number を使用）
  \expandafter\newunderlinetype\csname beginUnderWavyS\number\snamift@id\endcsname{%
    \cleaders\hbox{%
      \begin{tikzpicture}[xscale=.8,baseline=\f@size/4 pt,
                    x=\f@size/12 pt,y=\f@size/25 pt]
        \clip[yshift=\snamift@bottom] (1,\f@size/8 pt) rectangle (5,-\f@size/8 pt);
        \draw[line width=\f@size/24 pt,yshift=\snamift@bottom]
          (0,0) sin (1,1) cos (2,0) sin (3,-1) cos (4,0)
          sin (5,1) cos (6,0);
      \end{tikzpicture}%
    }%
  }%
  \expandafter\newunderlinetype\csname beginUnderWavyState\number\snamift@id\endcsname{%
    \cleaders\hbox{%
      \begin{tikzpicture}[xscale=.8,baseline=\f@size/4 pt,
                    x=\f@size/12 pt,y=\f@size/25 pt]
```

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```
      \begin{scope}[yshift=\f@size/1.2 pt]
        \clip[yshift=\snamift@bottom] (1,\f@size/8 pt) rectangle (5,-\f@size/8 pt);
        \draw[line width=\f@size/24 pt,yshift=\snamift@bottom]
          (0,0) sin (1,1) cos (2,0) sin (3,-1) cos (4,0)
          sin (5,1) cos (6,0);
      \end{scope}
    \end{tikzpicture}%
  }%
 }%
 % 4：使用（縦横の分岐；直接 csname を呼ぶ）
 {\ifnum\ltjgetparameter{direction}=3 %
   \csname beginUnderWavyState\number\snamift@id\endcsname{#2}%
 \else%
   \csname beginUnderWavyS\number\snamift@id\endcsname{#2}%
 \fi}%
}

\NewDocumentCommand{\namiKKAuto@make}{ O{} +m }{%
 \setlength{\snamift@bottom}{0ex}%
 \def\snamift@test@contents{#2}%
 \setkeys{snamift}{#1}%
 \setlength{\temp@depth@kk}{0pt}%
 \getdepth@kk{\snamift@test@contents}%
 \global\advance\snamift@id by 1\relax%
 \expandafter\newunderlinetype\csname beginUnderWavyS\number\snamift@id\endcsname{%
   \cleaders\hbox{%
     \begin{tikzpicture}[xscale=.8,baseline=\f@size/4 pt,x=\f@size/12 pt,y=\f@size/25 pt]
       \begin{scope}[yshift=-\temp@depth@kk]
         \clip[yshift=\snamift@bottom] (1,\f@size/8 pt) rectangle (5,-\f@size/8 pt);
         \draw[line width=\f@size/24 pt,yshift=\snamift@bottom]
           (0,0) sin (1,1) cos (2,0) sin (3,-1) cos (4,0)
           sin (5,1) cos (6,0);
       \end{scope}
     \end{tikzpicture}%
   }%
 }%
 \expandafter\newunderlinetype\csname beginUnderWavyState\number\snamift@id\endcsname{%
   \cleaders\hbox{%
     \begin{tikzpicture}[xscale=.8,baseline=\f@size/4 pt,
                     x=\f@size/12 pt,y=\f@size/25 pt]
       \begin{scope}[yshift=\f@size/1.2 pt-\temp@depth@kk]
         \clip[yshift=\snamift@bottom] (1,\f@size/8 pt) rectangle (5,-\f@size/8 pt);
         \draw[line width=\f@size/24 pt,yshift=\snamift@bottom]
           (0,0) sin (1,1) cos (2,0) sin (3,-1) cos (4,0)
           sin (5,1) cos (6,0);
       \end{scope}
     \end{tikzpicture}%
   }%
 }%
 {\ifnum\ltjgetparameter{direction}=3 %
```

```
    \csname beginUnderWavyState\number\snamift@id\endcsname{#2}%
  \else%
    \csname beginUnderWavyS\number\snamift@id\endcsname{#2}%
  \fi}%
}
\NewDocumentCommand{\namiKKAuto}{ O{} +m }{%
  \ifmmode
    \mathchoice
      {\mbox{\namiKKAuto@make[#1]{$\displaystyle #2$}}} % displaystyle
      {\mbox{\namiKKAuto@make[#1]{$#2$}}}        % textstyle (inline)
      {\mbox{\namiKKAuto@make[#1]{$#2$}}}        % scriptstyle
      {\mbox{\namiKKAuto@make[#1]{$#2$}}}        % scriptscriptstyle
  \else
    \namiKKAuto@make[#1]{#2}% テキストモードではそのまま出力（mboxで包まない）
  \fi
}
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%


%lua-ulで作ったtenKK,dashKK（元の名称はstengthとsdashgthだが、変更）%%%%%%%%%%%%%%%%%%%%%%

% 2025/11/10加筆修正
\newlength{\sladj@tenKK@dashKK}
\sladj@tenKK@dashKK =.07\zw


\newlength{\stength@radius}
\newlength{\stength@distance}
\newlength{\stength@bottom}

\define@key{stength}{radius}{\setlength{\stength@radius}{#1}}
\define@key{stength}{distance}{\setlength{\stength@distance}{#1}}
\define@key{stength}{bottom}{\setlength{\stength@bottom}{#1}}

\newcount\stength@id

\NewDocumentCommand{\tenKK}{ O{} +m }{%
  \setlength{\stength@radius}{.1ex}%
  \setlength{\stength@distance}{.4ex}%
  \setlength{\stength@bottom}{0ex}%
  \def\stength@test@contents{#2}%
  \setkeys{stength}{#1}%
  \edef\UL@rubyflag{\numexpr\directlua{RubyFlagKKUL("\luaescapestring{\unexpanded\expandafter
      {\stength@test@contents}}")}\relax}%
  \ifnum\ltjgetparameter{direction}=3
    \ifnum\UL@rubyflag=1
      \addtolength{\stength@bottom}{.5em}%
    \fi
  \fi%
  \global\advance\stength@id by 1\relax%
```

```
\expandafter\newunderlinetype\csname beginUnderDot\number\stength@id\endcsname{%
\xleaders\hbox{%
\begin{tikzpicture}[x=0.8ex,y=.2ex,baseline=.7ex]%
  \fill[mygray@luwa-ul,yshift=\stength@bottom+\sladj@tenKK@dashKK] (0.3,0) circle (\
        stength@radius);
  \path[use as bounding box,yshift=\stength@bottom+\sladj@tenKK@dashKK] (0,0) rectangle (\
        stength@distance,0);%.8
\end{tikzpicture}%
}%
}%
\expandafter\newunderlinetype\csname beginUnderDottate\number\stength@id\endcsname{%
\xleaders\hbox{%
\begin{tikzpicture}[x=0.8ex,y=.2ex,baseline=.7ex]%
  \begin{scope}[yshift=\f@size/1.1 pt]
  \fill[mygray@luwa-ul,yshift=\stength@bottom] (0.3,0) circle (\stength@radius);
  \path[use as bounding box,yshift=\stength@bottom] (0,0) rectangle (\stength@distance,0);
  \end{scope}
\end{tikzpicture}%
}%
}%
{\ifnum\ltjgetparameter{direction}=3 %
  \csname beginUnderDottate\number\stength@id\endcsname{#2}%
\else%
  \csname beginUnderDot\number\stength@id\endcsname{#2}%
\fi}%
}
\NewDocumentCommand{\tenKKAuto}{ O{} +m }{%
  \ifmmode
    \mathchoice
      {\mbox{\tenKKAuto@make[#1]{$\displaystyle #2$}}} % displaystyle
      {\mbox{\tenKKAuto@make[#1]{$#2$}}}        % textstyle (inline)
      {\mbox{\tenKKAuto@make[#1]{$#2$}}}        % scriptstyle
      {\mbox{\tenKKAuto@make[#1]{$#2$}}}        % scriptscriptstyle
  \else
    \tenKKAuto@make[#1]{#2}% テキストモードではそのまま出力（mboxで包まない）
  \fi
}

\NewDocumentCommand{\tenKKAuto@make}{ O{} +m }{%
  \setlength{\stength@radius}{.1ex}%
  \setlength{\stength@distance}{.4ex}%
  \setlength{\stength@bottom}{0ex}%
  \def\stength@test@contents{#2}%
  \setkeys{stength}{#1}%
  \setlength{\temp@depth@kk}{0pt}%
  \getdepth@kk{\stength@test@contents}%
  \global\advance\stength@id by 1\relax%
  \expandafter\newunderlinetype\csname beginUnderDot\number\stength@id\endcsname{%
  \xleaders\hbox{%
  \begin{tikzpicture}[x=0.8ex,y=.2ex,baseline=.7ex]%
```

```
    \begin{scope}[yshift=-\temp@depth@kk]
      \fill[mygray@luwa-ul,yshift=\stength@bottom+\sladj@tenKK@dashKK] (0.3,0) circle (\
          stength@radius);
      \path[use as bounding box,yshift=\stength@bottom+\sladj@tenKK@dashKK] (0,0) rectangle (\
          stength@distance,0);%.8
    \end{scope}
  \end{tikzpicture}%
}%
}%
\expandafter\newunderlinetype\csname beginUnderDottate\number\stength@id\endcsname{%
\xleaders\hbox{%
\begin{tikzpicture}[x=0.8ex,y=.2ex,baseline=.7ex]%
  \begin{scope}[yshift=\f@size/1.1 pt-\temp@depth@kk]
  \fill[mygray@luwa-ul,yshift=\stength@bottom] (0.3,0) circle (\stength@radius);
  \path[use as bounding box,yshift=\stength@bottom] (0,0) rectangle (\stength@distance,0);
  \end{scope}
\end{tikzpicture}%
}%
}%
{\ifnum\ltjgetparameter{direction}=3 %
  \csname beginUnderDottate\number\stength@id\endcsname{#2}%
\else%
  \csname beginUnderDot\number\stength@id\endcsname{#2}%
\fi}%
}


\newlength{\underdash@length}
\newlength{\underdash@distance}
\newlength{\underdash@width}
\newlength{\underdash@bottom}

\define@key{underdashgth}{length}{\setlength{\underdash@length}{#1}}
\define@key{underdashgth}{distance}{\setlength{\underdash@distance}{#1}}
\define@key{underdashgth}{width}{\setlength{\underdash@width}{#1}}
\define@key{underdashgth}{bottom}{\setlength{\underdash@bottom}{#1}}

\newcount\underdash@id

\NewDocumentCommand{\dashKK}{ O{} +m }{%
  \setlength{\underdash@length}{.4ex}%
  \setlength{\underdash@distance}{.3ex}%
  \setlength{\underdash@width}{.2pt}%
  \setlength{\underdash@bottom}{0ex}%
  \def\sdashgth@test@contents{#2}%
  \setkeys{underdashgth}{#1}%
  \edef\UL@rubyflag{\numexpr\directlua{RubyFlagKKUL("\luaescapestring{\unexpanded\expandafter
      {\sdashgth@test@contents}}")}\relax}%
  \ifnum\ltjgetparameter{direction}=3
    \ifnum\UL@rubyflag=1
```

```
        \addtolength{\underdash@bottom}{.5em}%
      \fi
    \fi%
    \global\advance\underdash@id by 1\relax%
    \expandafter\newunderlinetype\csname beginUnderDash\number\underdash@id\endcsname{%
      \xleaders\hbox{%
        \begin{tikzpicture}[x=0.8ex,y=.2ex,baseline=.7ex]%
          \draw[black,line width=\underdash@width,xshift=.25ex,yshift=\underdash@bottom+\
              sladj@tenKK@dashKK] (0,0) -- (\underdash@length,0);%
          \path[use as bounding box,yshift=\underdash@bottom+\sladj@tenKK@dashKK] (0,0) rectangle
              (\underdash@length+\underdash@distance,0);%
        \end{tikzpicture}%
      }%
    }%
    \expandafter\newunderlinetype\csname beginUnderDashtate\number\underdash@id\endcsname{%
      \xleaders\hbox{%
        \begin{tikzpicture}[x=0.8ex,y=.2ex,baseline=.7ex]%
          \begin{scope}[yshift=\f@size/1.1 pt]%
            \draw[black,line width=\underdash@width,xshift=.1ex,yshift=\underdash@bottom] (0,0) --
                (\underdash@length,0);%
            \path[use as bounding box,yshift=\underdash@bottom] (0,0) rectangle (\underdash@length
                +\underdash@distance,0);%
          \end{scope}%
        \end{tikzpicture}%
      }%
    }%
    {\ifnum\ltjgetparameter{direction}=3 %
      \csname beginUnderDashtate\number\underdash@id\endcsname{#2}%
    \else%
      \csname beginUnderDash\number\underdash@id\endcsname{#2}%
    \fi}%
}

\NewDocumentCommand{\dashKKAuto@make}{ O{} +m }{%
  \setlength{\underdash@length}{.4ex}%
  \setlength{\underdash@distance}{.3ex}%
  \setlength{\underdash@width}{.2pt}%
  \setlength{\underdash@bottom}{0ex}%
  \def\sdashgth@test@contents{#2}%
  \setkeys{underdashgth}{#1}%
  \setlength{\temp@depth@kk}{0pt}%
  \getdepth@kk{\sdashgth@test@contents}%
  \global\advance\underdash@id by 1\relax%
  \expandafter\newunderlinetype\csname beginUnderDash\number\underdash@id\endcsname{%
    \xleaders\hbox{%
      \begin{tikzpicture}[x=0.8ex,y=.2ex,baseline=.7ex]%
        \begin{scope}[yshift=-\temp@depth@kk]
          \draw[black,line width=\underdash@width,xshift=.25ex,yshift=\underdash@bottom+\
              sladj@tenKK@dashKK] (0,0) -- (\underdash@length,0);%
          \path[use as bounding box,yshift=\underdash@bottom+\sladj@tenKK@dashKK] (0,0)
```

```
              rectangle (\underdash@length+\underdash@distance,0);%
        \end{scope}
      \end{tikzpicture}%
    }%
  }%
  \expandafter\newunderlinetype\csname beginUnderDashtate\number\underdash@id\endcsname{%
    \xleaders\hbox{%
      \begin{tikzpicture}[x=0.8ex,y=.2ex,baseline=.7ex]%
        \begin{scope}[yshift=\f@size/1.1 pt-\temp@depth@kk]%
          \draw[black,line width=\underdash@width,xshift=.1ex,yshift=\underdash@bottom] (0,0) --
                (\underdash@length,0);%
          \path[use as bounding box,yshift=\underdash@bottom] (0,0) rectangle (\underdash@length
                +\underdash@distance,0);%
        \end{scope}%
      \end{tikzpicture}%
    }%
  }%
  {\ifnum\ltjgetparameter{direction}=3 %
    \csname beginUnderDashtate\number\underdash@id\endcsname{#2}%
  \else%
    \csname beginUnderDash\number\underdash@id\endcsname{#2}%
  \fi}%
}
\NewDocumentCommand{\dashKKAuto}{ O{} +m }{%
  \ifmmode
    \mathchoice
      {\mbox{\dashKKAuto@make[#1]{$\displaystyle #2$}}} % displaystyle
      {\mbox{\dashKKAuto@make[#1]{$#2$}}}        % textstyle (inline)
      {\mbox{\dashKKAuto@make[#1]{$#2$}}}        % scriptstyle
      {\mbox{\dashKKAuto@make[#1]{$#2$}}}        % scriptscriptstyle
  \else
    \dashKKAuto@make[#1]{#2}% テキストモードではそのまま出力（mboxで包まない）
  \fi
}
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%


%overLine%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
\define@key{overLine}{color}{%
  \def\overLineKK@color{#1}%
}

\newlength{\overLineKK@KK@Adjust}

\NewDocumentCommand{\overLineKK}{ O{} +m }{%
  \setlength{\overLineKK@KK@Adjust}{\f@size pt}%
  \def\overLineKK@color{black}%
  \def\overLineKK@test@contents{#2}%
  \setkeys{overLine}{#1}%
  \edef\UL@rubyflag{\numexpr\directlua{RubyFlagKKUL("\luaescapestring{\unexpanded\expandafter
```

```
      {\overLineKK@test@contents}}")}\relax}%
  \ifnum\ltjgetparameter{direction}=3%
    \ifnum\UL@rubyflag=1%
      \addtolength{\overLineKK@KK@Adjust}{.6em}%
    \else%
      \addtolength{\overLineKK@KK@Adjust}{.1em}%
    \fi%
  \else%
    \ifnum\UL@rubyflag=1%
      \addtolength{\overLineKK@KK@Adjust}{.6em}%
    \else%
      \addtolength{\overLineKK@KK@Adjust}{.1em}%
    \fi%
  \fi%
  \underLineKK[bottom=\overLineKK@KK@Adjust,color=\overLineKK@color]{#2}%
  }


\newlength{\temp@depth@kk@over}
\NewDocumentCommand{\getdepth@kk@over}{m}{%
  \ifnum\ltjgetparameter{direction}=3%
    \settodepth{\temp@depth@kk@over}{#1}%
    \addtolength{\temp@depth@kk@over}{-.45em}%
  \else%
    \settoheight{\temp@depth@kk@over}{#1}%
    \addtolength{\temp@depth@kk@over}{-.8em}%
    \setlength{\temp@depth@kk@over}{-\temp@depth@kk@over}%
  \fi%
}
\NewDocumentCommand{\overLineKKAuto}{ O{} +m }{%
  \setlength{\overLineKK@KK@Adjust}{\f@size pt}%
  \setlength{\temp@depth@kk@over}{0pt}%
  \def\overLineKK@color{black}%
  \def\overLineKK@test@contents{#2}%
  \getdepth@kk@over{\overLineKK@test@contents}%
  \setkeys{overLine}{#1}%
  \ifnum\ltjgetparameter{direction}=3%
    \addtolength{\overLineKK@KK@Adjust}{.1em}%
  \else%
    \addtolength{\overLineKK@KK@Adjust}{.1em}%
  \fi%
  \underLineKK@plain[bottom=\overLineKK@KK@Adjust-\temp@depth@kk@over,color=\overLineKK@color
      ]{#2}%
  }
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%


%グレーの蛍光ペン（細くて下の方だけ塗るやつ）%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
\newlength{\thinHighLight@KK@Adjust}
\newlength{\thinHighLight@KK@Adjust@ruby}
```

```
\newlength{\thinHighLight@KK@Adjust@ruby@yoko}
\newcommand{\thinHighLight@KK@Adjust@tmp}{%
  \ifnum\ltjgetparameter{direction}=3%
    \setlength{\thinHighLight@KK@Adjust}{-.3\zw}%
  \else%
    \setlength{\thinHighLight@KK@Adjust}{0ex}%
  \fi
}
\DeclareDocumentCommand{\thinHighLight}{ O{color=gray} +m }{%
  \thinHighLight@KK@Adjust@tmp%
  \def\thinHighLight@test@contents{#2}%
  \setlength{\thinHighLight@KK@Adjust@ruby}{0em}%
  \setlength{\thinHighLight@KK@Adjust@ruby@yoko}{0em}%
  \edef\UL@rubyflag{\numexpr\directlua{RubyFlagKKUL("\luaescapestring{\unexpanded\expandafter
      {\thinHighLight@test@contents}}")}\relax}%
  \ifnum\ltjgetparameter{direction}=3
    \ifnum\UL@rubyflag=1
      \setlength{\thinHighLight@KK@Adjust@ruby}{-.5em}%
    \fi
  \fi
  \underLineKK[#1,height=.25\underLine@KK@Adjust@tmp-\thinHighLight@KK@Adjust@ruby,bottom
      =-.04\underLine@KK@Adjust@tmp+\thinHighLight@KK@Adjust+\thinHighLight@KK@Adjust@ruby
      ]{#2}%
}


\newlength{\thickHighLight@KK@Adjust}
\newlength{\thickHighLight@KK@Adjust@ruby}
\newlength{\thickHighLight@KK@Adjust@ruby@yoko}
\newcommand{\thickHighLight@KK@Adjust@tmp}{%
  \ifnum\ltjgetparameter{direction}=3%
    \setlength{\thickHighLight@KK@Adjust}{-1.1\zw}%
  \else%
    \setlength{\thickHighLight@KK@Adjust}{0ex}%
  \fi
}
\DeclareDocumentCommand{\thickHighLight}{ O{color=gray} +m }{%
  \thickHighLight@KK@Adjust@tmp%
  \def\thickHighLight@test@contents{#2}%
  \setlength{\thickHighLight@KK@Adjust@ruby}{0em}%
  \setlength{\thickHighLight@KK@Adjust@ruby@yoko}{0em}%
  \edef\UL@rubyflag{\numexpr\directlua{RubyFlagKKUL("\luaescapestring{\unexpanded\expandafter
      {\thickHighLight@test@contents}}")}\relax}%
  \ifnum\ltjgetparameter{direction}=3
    \ifnum\UL@rubyflag=1
      \setlength{\thickHighLight@KK@Adjust@ruby}{-.5em}%
    \fi
  \else
    \ifnum\UL@rubyflag=1
      \setlength{\thickHighLight@KK@Adjust@ruby}{-.5em}%
```

```
    \setlength{\thickHighLight@KK@Adjust@ruby@yoko}{.5em}%
    \fi
  \fi
  \underLineKK[#1,height=1.15\underLine@KK@Adjust@tmp-\thickHighLight@KK@Adjust@ruby,bottom
      =-.04\underLine@KK@Adjust@tmp+\thickHighLight@KK@Adjust+\thickHighLight@KK@Adjust@ruby
      +\thickHighLight@KK@Adjust@ruby@yoko]{#2}%
}
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%


%二重線%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
\newlength{\nijyusen@bottom}
\newlength{\nijyusen@bottom@adjust}

\define@key{nijyusen}{color}{\def\nijyusen@KK@color{#1}}
\define@key{nijyusen}{bottom}{\setlength{\nijyusen@bottom}{#1}}

\NewDocumentCommand\nijyusen{ O{} +m }{%
  \def\nijyusen@KK@color{black}%
  \setlength{\nijyusen@bottom}{0ex}%
  \setkeys{nijyusen}{#1}%
  \ifnum\ltjgetparameter{direction}=3%
    \setlength{\nijyusen@bottom@adjust}{-\nijyusen@bottom}%
  \else%
    \setlength{\nijyusen@bottom@adjust}{\nijyusen@bottom}%
  \fi%
  \underLineKK[bottom=-.1\underLine@KK@Adjust@tmp+\nijyusen@bottom,color=\nijyusen@KK@color]{\
      underLineKK[bottom=\nijyusen@bottom@adjust,color=\nijyusen@KK@color]{#2}}%
}

\NewDocumentCommand{\nijyusenAuto@make}{ O{} +m }{%
  \def\nijyusen@KK@color{black}%
  \def\nijyusen@test@contents{#2}%
  \setlength{\temp@depth@kk}{0pt}%
  \getdepth@kk{\nijyusen@test@contents}%
  \setlength{\nijyusen@bottom}{0ex}%
  \setkeys{nijyusen}{#1}%
  \ifnum\ltjgetparameter{direction}=3%
    \setlength{\nijyusen@bottom@adjust}{-\nijyusen@bottom}%
  \else%
    \setlength{\nijyusen@bottom@adjust}{\nijyusen@bottom}%
  \fi%
  \underLineKK@plain[bottom=-.1\underLine@KK@Adjust@tmp+\nijyusen@bottom-\temp@depth@kk,color
      =\nijyusen@KK@color]{\underLineKK@plain[bottom=\nijyusen@bottom@adjust-\temp@depth@kk,
      color=\nijyusen@KK@color]{#2}}%
}
\NewDocumentCommand{\nijyusenAuto}{ O{} +m }{%
  \ifmmode
    \mathchoice
      {\mbox{\nijyusenAuto@make[#1]{$\displaystyle #2$}}} % displaystyle
```

```
    {\mbox{\nijyusenAuto@make[#1]{$#2$}}}        % textstyle (inline)
    {\mbox{\nijyusenAuto@make[#1]{$#2$}}}        % scriptstyle
    {\mbox{\nijyusenAuto@make[#1]{$#2$}}}        % scriptscriptstyle
  \else
    \nijyusenAuto@make[#1]{#2}% テキストモードではそのまま出力（mboxで包まない）
  \fi
}


\newlength{\keshinijyuusen@KK@Adjust}
\newcommand{\keshinijyuusen@KK@Adjust@tmp}{%
  \ifnum\ltjgetparameter{direction}=3%
    \setlength{\keshinijyuusen@KK@Adjust}{0ex}%
  \else%
    \setlength{\keshinijyuusen@KK@Adjust}{.15ex}%
  \fi
}
\define@key{keshinijyusen}{color}{\def\keshinijyusen@KK@color{#1}}
\NewDocumentCommand{\keshinijyusen}{ O{} +m }{%
  \def\keshinijyusen@KK@color{color=black}%
  \def\keshinijyusen@test@contents{#2}%
  \setkeys{keshinijyusen}{#1}%
  \keshinijyuusen@KK@Adjust@tmp%
  \underLineKK@plain[bottom=.57\underLine@KK@Adjust@tmp-\keshinijyuusen@KK@Adjust,#1]{\
        underLineKK@plain[bottom=.47\underLine@KK@Adjust@tmp-\keshinijyuusen@KK@Adjust,#1]{#2}}
}
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%


%下線の前に番号を振る%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
\newcommand{\linenumbering@luwa}[1]{\raisebox{-1ex}{\scalebox{.6}{#1}}}

\newdimen\overtline@f@size
\NewDocumentCommand{\tlinenumbering@luwa}{s m}{%
  \setlength{\overtline@f@size}{\f@size pt}%
  \raisebox{.6\overtline@f@size}{\IfBooleanTF{#1}{\tikz[baseline=(char.base)]{\node[inner sep
        =0pt, anchor=center, scale=.6] (char) {#2};}}{\tikz[baseline=(char.base)]{\node[inner
        sep=0pt, anchor=center, scale=.6, rotate=90] (char) {#2};}%
}}\hskip.15ex}

\NewDocumentCommand{\LineNumbering}{ s m O{0ex} }{% 縦横両対応
  \ifnum\ltjgetparameter{direction}=3%
    \IfBooleanTF{#1}{\raisebox{#3}{\tlinenumbering@luwa*{#2}}}{\raisebox{#3}{\
        tlinenumbering@luwa{#2}}}%
  \else
    \raisebox{#3}{\linenumbering@luwa{#2}}%
  \fi
}
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

`\endinput`