`rowmantic`: Tables row by row

A Typst package for editing tables row-by-row.

The idea is a row-oriented way to input tables, with just a little less syntactical overhead than the usual `table` function in Typst.

The `rowtable` function works like the usual `table` function but takes one markup block (`[...]`) per row, and the markup is split internally[1] on a delimiter which is `&` by default.

Input:	`[A & B & C]`
Table cells (effectively):	`..([A], [B], [C])`

For improved table ergonomics, the table sizes the number of columns by the longest row. All rows are effectively completed so that they are of full length. This creates a better the editing experience, as rows can be filled out gradually.

Examples

Document Result

goá	*iáu-boē*	*koat-tēng*	*tang-sî*	*boeh*	*tńg-khì*
goa^{1}	iau^{1}-boe^{3}	koat^{2}-teng^{3}	tang^{7}-si^{5}	boeh^{2}	tng^{1}-khi^{3}
goa^{2}	iau^{2}-boe^{7}	koat^{4}-teng^{7}	tang^{1}-si^{5}	boeh^{4}	tng^{2}-khi^{3}
I	not-yet	decide	when	want	return.

“I have not yet decided when I shall return.”

Input

```
#{
  show regex("\d"): super.with(size: 0.8em, typographic: false)
  show table.cell: it => { set text(size: 0.9em) if it.y >= 1; it }
  show table.cell.where(y: 0): emph
  rowtable(
    separator: ",",   // configurable separator
    stroke: none,     // pass through table arguments, hlines, cells et.c.
    inset: (x: 0em),
    column-gutter: 0.9em,
    // rows are filled to be equal length after collecting cells
    [goá,   iáu-boē,    koat-tēng,    tang-sî,    boeh,   tńg-khì   ],
    [goa1,  iau1-boe3,  koat2-teng3,  tang7-si5,  boeh2,  tng1-khi3 ],
    [goa2,  iau2-boe7,  koat4-teng7,  tang1-si5,  boeh4,  tng2-khi3 ],
    [I,     not-yet,    decide,       when,       want,   return.   ],
    table.hline(),
    // cell that fills remainder of row
    expandcell["I have not yet decided when I shall return."],
  )
}
```

Example from Wikipedia[2]

[1] But shallowly - not looking into styled or nested content

[2] https://en.wikipedia.org/wiki/Interlinear_gloss

Document Result

Term	Explanation	Assumptions
$\mathbf{X}$	Explanatory variables	Non-random
$\mathbf{Y}$	$Y_1, ..., Y_n$ observations	**Pairwise independent**
β	Model parameters	

Input

```
#{
  set table(stroke: none, inset: 0.8em)
  set table.hline(stroke: 0.5pt)
  show table.cell.where(y: 0): strong
  show table.cell.where(x: 0): x => math.bold(math.upright(x))
  rowtable(
    table.hline(),
    table.header([Term  & Explanation         & Assumptions ]),
    table.hline(),
    [$X$      & Explanatory variables         & Non-random ],
    [$Y$      & $Y_1, ..., Y_n$ observations  & *Pairwise independent*],
    [$beta$   & Model parameters              ],
    table.hline(),
  )
}
```

Trying some more difficult examples

Document Result

<table>
<tr><td>Literal &</td><td>Strong</td><td>X–Y</td></tr>
<tr><td>Equation
$\pi = 3.1415...$</td><td>$\int_\Omega d\omega$</td><td>$X \& Y$</td></tr>
<tr><td>π^1</td><td>π^2</td><td>π^3</td></tr>
<tr><td>• A
• B</td><td>1. A
2. B</td><td>A a
B b</td></tr>
<tr><td>Figure 1: Top
A</td><td>See Figure 1 & Figure 2</td><td>B
Figure 2: Bot</td></tr>
<tr><td>Nested rowtable
A B</td><td>Nested table
A B</td><td rowspan="2">table.cell(
rowspan: 2)</td></tr>
<tr><td colspan="2">Cell with colspan=2</td></tr>
<tr><td colspan="2">Expandcell</td><td></td></tr>
<tr><td>N/A</td><td>N/A</td><td>N/A</td></tr>
</table>

Input

```
#rowtable(
  align: horizon,
  stroke: 0.1pt,
  row-filler: [N/A],
  [Literal \& & *Strong* & *X*--_Y_ ],
  [Equation \ $pi = 3.1415...$ & $ integral_Omega d omega $  & $X \& Y$],
  $ pi^1 & pi^2 & pi^3 $,
  [
    - A
    - B
    &
    + A
    + B
    &
    / A: a
    / B: b
  ],
  [
    #{
      set figure.caption(position: top)
      [#figure(rect[A], caption: "Top")<fig1>]
    }
    &
    See @fig1 \& @fig2
    &
    #figure(rect[B], caption: "Bot")<fig2>
  ],
  {
    [Nested rowtable \ ]
    rowtable([A & B])
    [&]
    [Nested table \ ]
    table(columns: 2, [A], [B])
    [&]
    table.cell(stroke: 1pt + red, rowspan: 2)[`table.cell(` \ `rowspan: 2)`]
  },
  [#table.cell(fill: yellow.lighten(90%), colspan: 2)[Cell with colspan=2] ],
  [#expandcell(fill: yellow.lighten(90%))[Expandcell] & #expandcell[#none]],
  table.footer([]),
)
```

Double semicolon separator

Document Result

First	This is a literal ;; and ; and , and &
Second; Third	Equation $\pi = 3.1415...$

Input

```
#rowtable(
  separator: ";;",
  stroke: 0.5pt,
  [First           ;; This is a literal \;\; and ; and , and & ],
  [Second; Third   ;; Equation $pi = 3.1415...$],
)
```

Combine with pillar (or other table function)

Use the `table` argument to let rowtable pass its result to a different table function rather than the standard one, for example `pillar.table` (shown below) or `zero.ztable`.

Document Result

Isotope	Z	N	Half-life	Mass (Da)	Abundance (%)
^{107}Ag	47	60	Stable	106.905 091 5(26)	51.839 ± 0.008
^{109}Ag	47	62	Stable	108.904 755 8(14)	48.161 ± 0.008

Input

```
#import "@preview/pillar:0.3.2"
#set text(font: "Libertinus Serif")
#show table.cell.where(y: 0): strong
#rowtable(
  separator: ",",
  table: pillar.table,
  cols: "rCCCCC",
  format: (auto, ) * 4 + ((uncertainty-mode: "compact"), auto),
  column-gutter: (0.5em, 0pt),
  stroke: (x, y) => if y == 0 { (bottom: 0.75pt) },
  table.header(
  [Isotope,       Z,  N,  Half-life,  Mass (Da),        Abundance (%) ]),
  [#super[107]Ag, 47, 60, Stable,     106.9050915(26),  51.839(8) ],
  [#super[109]Ag, 47, 62, Stable,     108.9047558(14),  48.161(8) ],
)
```

Equations

Equations as rows are are split on `&` by default. Other symbols are possible. Note that `&` can be escaped in equations, but other separator symbols are not as easy to escape[3].

Document Result

A	B	C	D	E
1	x	x^2	$\sum_i^n$	inline equation row
1	x	x^2	$\sum_i^n$	block equation row
1	x	x^2	$\sum_i^n$	markup with embedded equations row

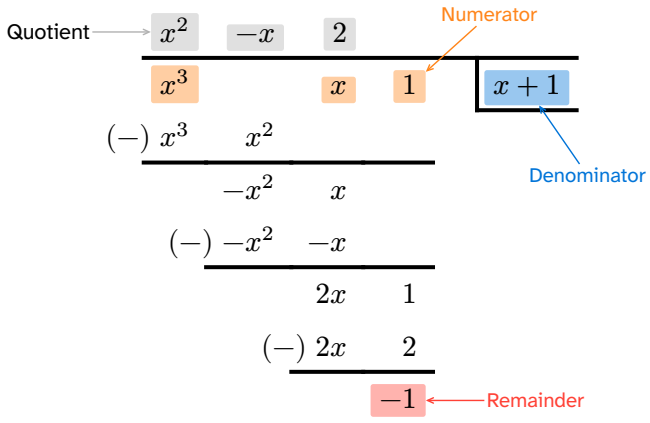
Input

```
#rowtable(
  align: center + horizon,
  stroke: (x, y) => (bottom: int(y == 0) * 1pt),
  separator: ",",     // regular sep
  separator-eq: $&$,  // equation sep
  [A, B, C, D, E],
  $1  & x   & x^2 & sum_i^n & #[inline equation row]$,
  $ 1 & x   & x^2 & sum_i^n & #[block equation row] $,
  [$1$, $x$, $x^2$, $ sum_i^n $, markup with embedded \ equations row],
)
```

Long Division

This example shows one way to set up long division. In this case it's polynomial division, computing the result $x^3 + x + 1 = (x^2 - x + 2)(x + 1) - 1$. For this example, the colorful annotations add the most of the complexity. `rowtable` contributes to the example by splitting equations on the separator and filling rows to be equal length.

Document Result



Input

```
#import "@preview/mannot:0.3.0": annot, markhl
```

[3]The escape for `&` is just `\&`, for other separators like for example the comma use a `box` to escape them in an equation.

```
/// Set up strokes and gutter for long division table
#let longdiv(..args, table: std.table) = {
  let cols = args.at("columns")
  let st = std.stroke(args.at("stroke", default: black))
  let stroke = (x, y) => (
     // Add left stroke to the last column
    left: if x == cols - 1 and y == 1 { st },
    bottom: if (
      // Add top and bottom stroke to denominator cell
      y == 1 and x == cols - 1
      // Add bottom stroke every two rows (calc.even check),
      // but for one less column each time
      or y >= 1 and x < cols - 1 and calc.even(y) and x + 1 >= y / 2
    ) {
      st
    }
  )
  table(..args,
    column-gutter: (0pt,) * (cols - 2) + (1.5em, ),
    stroke: stroke,
    std.table.hline(y: 1, stroke: st))
}

// Set up marking functions
#let markhl = markhl.with(outset: (top: 0.15em, rest: 0.30em), radius: 1pt)
#let um = math.class("unary", math.minus) // unary minus
#let mkq = markhl.with(color: luma(70%))
#let mkn = markhl.with()
#let mkdenom = markhl.with(color: blue, tag: <denom>)
#let mkrem = markhl.with(color: red, tag: <rem>)

#let leftset(x) = box(place(dx: -0.3em, right + bottom, $#x$))
#let rm = math.class("unary", leftset($(-)$)) // row minus

#show: block.with(breakable: false)
#rowtable(
  align: right,
  table: longdiv.with(stroke: 1.5pt),
  inset: 0.55em,
  $mkq(x^2, tag: #<ans>)& mkq(um x) & mkq(2)    &$,
  $mkn(x^3) &           & mkn(x)    & mkn(1, tag: #<num>) & mkdenom(x + 1)$,
  $rm x^3   & x^2$,

  $         &-x^2       &  x$,
  $         & rm -x^2 & -x$,

  $         &           &   2x  & 1$,
  $         &           &rm 2x  & 2$,

  $         &           &       & mkrem(um 1)$,
)
#annot(<ans>, pos: left + horizon, dx: -2em, dy: -0em, annot-text-props: (fill:
black, size: 0.75em))[Quotient]
#annot(<denom>, pos: right + bottom, dy: +2em)[Denominator]
#annot(<num>, pos: right + top, dy: -1.5em, dx: 1em)[Numerator]
#annot(<rem>, pos: right + horizon, dy: 0em, dx: 2em)[Remainder]
```

Equations with alignment

Use a different separator than `&` to use equations with alignment.

Document Result

Matrix Form	Equation System Form
$\begin{bmatrix} y_1 \\ y_2 \end{bmatrix} = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$	$(1\text{st})\ y_1 = a_{11}x_1 + a_{12}x_2$ $(2\text{nd})\ y_2 = a_{21}x_1 + a_{22}x_2$

Input

```
#set math.mat(delim: "[")
#rowtable(
  separator: ";",
  stroke: (x, y) => (bottom: int(y == 0) * 1pt),
  [Matrix Form; Equation System Form],
  $
    mat(y_1; y_2) = mat(a_11, a_12; a_21, a_22) mat(x_1; x_2)
    ;
    "(1st)" y_1 &= a_11 x_1 &+ a_12 x_2 \
    "(2nd)" y_2 &= a_21 x_1 &+ a_22 x_2 \
  $
)
```

Table Cells, `rowspan` and `colspan`

- `colspan`: a cell spans multiple columns
- `rowspan`: a cell spans multiple rows

Table cells can be customized with the usual properties (`stroke`, `fill`, et.c.) but also with colspan and rowspan. It's important to include the cells inline inside the rows, i.e like this:

Document Result

1	2	3	4
A	B	Extra Wide	

Input

```
#let cell = table.cell
#rowtable(
  separator: ",",
  columns: (3em, ) * 4,
  [1, 2, 3,     #cell(fill: yellow)[4]],
  [A, B, #cell(colspan: 2, stroke: 2pt)[Extra Wide]],
)
```

where `[...]` is the markup for the whole row. Then automatic row length computations will continue to work correctly.

The column span is straightforward, because it's contained in the row, so support for this was available from `rowmantic`'s first version.

However, there is also support for `rowspan` since version 0.2.0:

Document Result

Square		1	2	**3**	4
		Expand			**D**
e	f	g	h		
Expandcell				ijk	

Input

```
#show table.cell: it => if it.colspan + it.rowspan > 2 { strong(it) } else { it }
#let cell = table.cell
#rowtable(
  separator: ",",
  [#cell(rowspan: 2, colspan: 2)[Square], 1, 2, #cell(rowspan: 3)[3], 4],
  [#expandcell[Expand], #cell(rowspan: 3)[D]],
  [e, f, g, h],
  [#expandcell[Expandcell], ijk],
)
```