# rowmantic

A Typst package for row-wise table editing

| | |
|---|---|
| **version** | 0.2.1 |
| **import as** | `#import "@preview/rowmantic:0.2.1"` |
| **typst universe** | https://typst.app/universe/package/rowmantic |
| **repository** | https://github.com/typst-community/rowmantic |

## 1 Introduction

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 takes a markup block `[...]` per row, and the markup is split internally[1] on a delimiter which is `&` by default. In all other aspects it works like the usual `table` function, with `stroke`, `fill`, `hline` and so on.

Input:

```
rowtable(
  [A & B],
  [C & D & E])
```

| | | |
|---|---|---|
| A | B | |
| C | D | E |

Equivalent table:

```
table(columns: 3,
  [A], [B], [],
  [C], [D], [E])
```

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.

## Contents



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

# 2 Examples

## 2.1 Introductory 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*

```
#import "@preview/rowmantic:0.2.1": rowtable, expandcell
#{
  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]

[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** |
| $\beta$ | Model parameters | |

*Input*

```
#import "@preview/rowmantic:0.2.1": rowtable
#{
  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(),
  )
}
```

## 2.2 Escaping and Various Examples

*Document Result*

| *Emphasis &* | **Strong &** | Literal & |
|---|---|---|
| $\int_{-\infty}^{\infty} f(x)\,dx$ | $\int_{0}^{\infty} f(t)\,e^{-st}\,dt$ | $X\&Y$ |
| Figure 1: Top<br>A | See Figure 1<br>& Figure 2 | B<br>Figure 2: Bot |
| 1. A<br>2. B | **A** a<br>**B** b | A B |
| A | B | C |

Escape the separator with \&

Display equations as a row

`set` rules need to be enclosed so that they don't try to style the separator itself.

Lists and other larger elements can be embedded as usual.

Colorfully filled cells

*Input*

```
#rowtable(
  align: horizon,
  column-width: 1fr,
  row-filler: [N/A],
  stroke: (x, y) => { if x == 3 { (y: 0pt, right: 0pt) } else { (x: 0.5pt, y: 0.5pt) } },
  [_Emphasis &_   & *Strong &*  & Literal \&  & Escape the separator with `\&`],
  $ integral_(-oo)^oo f(x) thin d x   & integral_0^oo f(t) thin e^(-s t) thin d t
    & X \& Y & "Display equations" \ "as a row" $,
  [
    #{
      set figure.caption(position: top)
      [#figure(rect[A], caption: "Top")<fig1>]
    }
    &
    See @fig1 \ \& @fig2
    &
    #figure(rect[B], caption: "Bot")<fig2>
    &
    ```typc set``` rules need to be enclosed so that they don't try
    to style the separator itself.
  ],
  [
    + A
    + B
    &
    / A: a
    / B: b
    & #rowtable([A & B])
    & Lists and other larger elements can be embedded as usual.
  ],
  [ #table.cell(fill: yellow)[A]  & #table.cell(fill: orange)[B]  &
    #table.cell(fill: red)[C]     & Colorfully filled cells ],
)
```
```

## 2.3 Double Semicolon Separator

The cell separator can be more than a single character, like in this example.

*Document Result*

| First | Second; Third |
|---|---|
| Fourth | This is a literal ;; and ; and , and & |

*Input*

```
#rowtable(
  separator: ";;",
  stroke: 0.5pt,
  [First    ;; Second; Third ],
  [Fourth   ;; This is a literal \;\; and ; and , and & ],
)
```

## 2.4 Using other Table Functions

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) | $51.839 \pm 0.008$ |
| $^{109}$Ag | 47 | 62 | Stable | 108.904 755 8(14) | $48.161 \pm 0.008$ |

*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) ],
)
```

## 2.5 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: ",",
  column-width: 3em, rows: 3em,
  [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, but there is also support for `rowspan`, seen below. The rows that follow take the `rowspan`-reserved space into account when computing their effective length.

*Document Result*

| **Rs2, Cs2** | | 1 | 2 | **Rs3** | 4 |
|---|---|---|---|---|---|
| | | **expandc.** | | | **Rs3** |
| 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: ",",
  column-width: 2.5em, rows: 2.5em,
  inset: 0.25em,
  [#cell(rowspan: 2, colspan: 2)[Rs2, Cs2], 1, 2, #cell(rowspan: 3)[Rs3], 4],
  [#expandcell[expandc.], #cell(rowspan: 3)[Rs3]],
  [e, f, g, h],
  [#expandcell[expandcell], ijk],
)
```

## 2.6 Equations

Equations as rows are are split on `&` by default, but it is configurable. 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 |

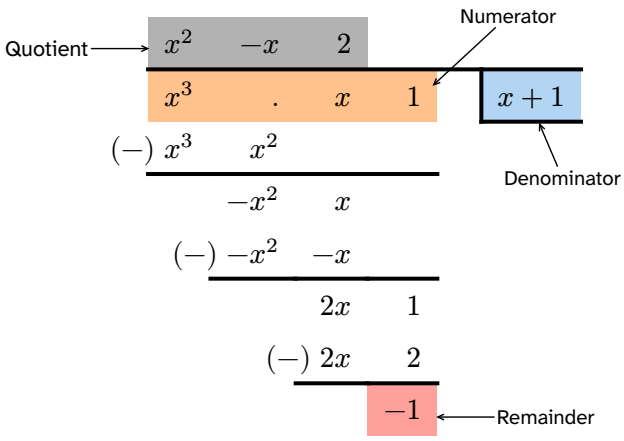
*Input*

```
#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],
)
```

### 2.6.1 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*




[3]The escape for `&` is just `\&`, for other separators like for example the comma a `box` or `","` is used to escape them.

*Input*

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

/// 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) => (
    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 and table cell backgrounds
#let mark = mark.with(outset: (top: 0em, rest: 0.50em))
#let mkq(..args) = table.cell(fill: luma(70%), mark(..args))
#let mkn(..args) = table.cell(fill: orange.lighten(50%), mark(..args))
#let mkdenom(it) = table.cell(fill: blue.lighten(70%), mark(tag: <denom>, it))
#let mkrem(it)   = table.cell(fill: red.lighten(50%), mark(tag: <rem>, it))

#let um = math.class("unary", math.minus) // unary minus
#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,
  $mkq(x^2, tag: #<ans>)& mkq(um x) & mkq(2)    &$,
  $mkn(x^3) & mkn(.)    & mkn(x)    & mkn(1, tag: #<num>) & mkdenom(x + 1)$,
  $rm x^3   & x^2$,

  $         &-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: 1.5em, dx: -1.0em)[Denominator]
#annot(<num>, pos: right + top, dy: -2.0em, dx: 1.5em)[Numerator]
#annot(<rem>, pos: right + horizon, dy: 0em, dx: 2em)[Remainder]
```

### 2.6.2 Equations with Alignment

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

*Document Result*

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

*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 \
  $
)
```

### 2.6.3 Sizing Delimiters in Annotated Matrix

This example draws a matrix using `rowtable` and inserts iteratively sized delimiters in `rowspan` cells. Grid lines are drawn to show how the table is constructed.

*Document Result*

| | | $(k)$ | $(l)$ | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| $(a)$ | $\left[\right.$ | $n$ | $\sum_{i=1}^{n} x_i$ | $\left.\right]$ | $\left[\right.$ | $\beta_0$ | $\left.\right]$ |
| $(b)$ | | $\sum_{i=1}^{n} x_i$ | $\sum_{i=1}^{n} x_i^2$ | | | $\beta_1$ | |

*Input*

```
/// Measure a table's size
/// Successively remove display of each row
///  (first full table, then remove 0, then remove 0 and 1, and so on).
/// Returns an array of measurements which is a size profile of the array's rows
/// (or columns if `attr: "x"`)
#let measure-table(t, min: 0, max: 50, attr: "y") = {
  let wh = (x: "width", y: "height").at(attr)
  let result = ()
  for i in range(max) {
    let sz = measure({
      show table.cell: it => {
        if it.at(attr) < i { none } else { it }
      }
```

```
      t
    })
    result.push(sz)
    if i > min and (sz.at(wh) == 0pt or result.at(-2, default: none) == sz) {
      break
    }
  }
  result
}

/// Create an element using `func`; then measure it using `measure-func`
/// then create the final version of the element again using func, this
/// time with the size info from the first try.
#let measure-and-make(func, measure-func: measure-table) = context {
  func(measure-func(func(none)))
}

#measure-and-make(sizeinfo => {
  set text(size: 1.5em)
  let nrows = 2
  // use row height information from size profile with one row removed.
  let row = if sizeinfo != none { sizeinfo.at(1).height / nrows } else { 1em }
  let delimheight = row * 0.90 * nrows
  let delim(p) = table.cell(rowspan: nrows, $lr(#p, size: #delimheight)$, inset:
0em)
  let open = delim([\[])
  let close = delim([\]])
  rowtable(
    stroke: 0.10pt + blue,
    align: horizon,
    inset: 0.4em,
    $     &      & (k)     & (l) &&& $,
    $ (a) & open & n       & sum_(i=1)^n x_i   & close & open & beta_0 & close $,
    $ (b) &        sum_(i=1)^n x_i & sum_(i=1)^n x_i^2 &        beta_1 $,
  )
})
```

## 3 Known Limitations

- Multi-row `table.header/footer` are not supported yet.
- `rowspan` is not supported in cells in rows inside `table.header/footer`.
- `expandcell` can collide with `rowspan`ned cells (if they are not placed along the left or right side of the table); use `colspan` as a workaround when necessary.
- Table cells can be passed outside the rows, and this removes the usefulness of automatic column lengths. Avoid doing this.
- `rowtable` does not properly support being used as a “front end” for `grid`.

# 4 Function Reference

## 4.1 expandcell

An expandcell is a `table.cell` that expands its `colspan` to available width. The expandcell can be passed alone as a whole row, or should be placed inside a row markup block to form part of a row.

**Parameters**

```
expandcell(
  body: content,
  ..args: arguments
)
```

**body** `content`

Cell body

**..args** `arguments`

`table.cell` arguments, except `colspan` and `rowspan` which are not permitted.

## 4.2 row-split

Take a sequence (content) and split it into an array by the given separator. It's split only shallowly, not deeply; the separators must exist in the uppermost sequence's content.

**Parameters**

```
row-split(
  it: content,
  sep: str,
  strip-space: bool
) -> array
```

**it** `content`

Text or sequence or other content

**sep** `str`

Separator

Default: `"&"`

**strip-space** `bool`

Remove leading/trailing spaces from split sequences

Default: `true`

## 4.3 rowtable

Table which takes table cell inputs in rows.

Each row is passed as one markup block `[...]` which is split internally on the separator. Rows that are shorter than the longest row (or the configured `columns`) will be filled to be the same length as all other rows.

Rows can also be passed as equations (`$...$`) and they are then split into cells by `separator-eq`.

Leading/trailing spaces are removed from each table element in rows. To preserve such spaces, use `~`.

This function wraps the standard `table` function and passes through all its regular arguments.

Passing `table.cell` outside rows is possible but not recommended. Passing `#table.cell[]` inside a row, between separators, is supported and can be used with `colspan` >= 1 and/or `rowspan >= 1`. Successive rows will take rowspans into account when computing their length.

It is supported to input rows inside `table.header` and `table.footer`.

**Parameters**

```
rowtable(
  separator: str,
  separator-eq: none auto equation,
  row-filler: none content,
  column-width: length relative fraction array,
  table: function,
  ..args: arguments
)
```

**separator** `str`

Configurable cell separator in rows. Good choices are `"&"`, `","` or `";"`. Escape the separator using e.g. `\&`

Default: `"&"`

**separator-eq** `none` or `auto` or `equation`

Cell separator for equations, must be single symbol. By default depends on `separator` if possible otherwise falls back to `$&$`. Set to `none` to disable splitting equations.

Default: `auto`

**row-filler** `none` or `content`

Value used to fill rows that are too short.

Default: `none`

**column-width** `length` or `relative` or `fraction` or `array`

Set column width without specifying number of columns. A single length is repeated for all columns. An array of lengths is repeated by extending with the last item.

Default: `none`

**table** `function`

Table function to use to build the final table. Intended for use with table wrappers from other packages. (The function `arguments` can be used for argument pass-through.)

Default: `std.table`

**..args** `arguments`

Rows like `[A & B & C]` and other positional or named table function parameters. Arguments to `table` pass through. A `columns` argument to the table is possible but not mandatory.

API Documentation generated using `tidy`.