

# `tbl.typ`: a `tbl`-like preprocessor for Typst and `tablex`

Version **TK**

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# Introduction

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Typst [1] is “a new markup-based typesetting system that is powerful and easy to learn.” While Typst provides a built-in `table()` function, it does not currently support more advanced features such as row spans and column spans, fine-grain control of borders, or complex cell alignments. Pg Biel’s `tablex` project [2] provides many of these features. However, it remains the case that writing a table using either `table()` or `tablex()` can require rather verbose syntax.

The `tbl.typ` project is an effort to allow the expression of rich tables in Typst using a more terse syntax. This syntax comes from a UNIX heritage: the `tbl` preprocessor which designed for use with the traditional TROFF typesetting system [3] [4] [5]. Important differences between the syntax of traditional `tbl` and `tbl.typ` are noted in Section **TK**.

After importing the library using `#import "tbl.typ"`, the basic format of a table when using `tbl.typ` is the following:

```
```tbl
Format specifications .
Data
```
```

The two main components of this syntax are:

- *Format specifications*. This describes the layout of the table in terms of the number and style of columns for each row.

The last line of the format specifications must end in a period (`.`). This is the separator between the two sections.

- *Data*. This is the content that will fill each cell of the table. Generally every line of input in this section corresponds to a row in the table, though there are exceptions noted later. Cells are separated by the `tab` option which defaults to a TAB character.

# Region options

In addition to the overall [table syntax](#) itself, you may specify *region options* that control the parsing and styling of the table as a whole using a “show-everything” rule prior to the tables you would like to control. For example:

```
#show: tbl.template.with(
  allbox: true,
  tab: "|",
)
```

The following options are recognized:

|                                   |  |
|-----------------------------------|--|
| <b>auto-lines</b> ,<br>allbox     | Like <a href="#">box</a> , but also draw a line between every cell if <b>true</b> . This is the same option from <a href="#">tablex</a> .<br><br><i>Default:</i> <b>false</b>  |
| <b>box</b> ,<br>frame             | If <b>true</b> , draw a line around the entire table.<br><br><i>Default:</i> <b>false</b>  |
| <b>breakable</b> ,<br>nokeep      | If <b>true</b> , the table can span multiple pages if necessary.<br><br><i>Default:</i> <b>false</b>   |
| <b>center</b> ,<br>centre         | Aliases for a <a href="#">tbl-align</a> value of <b>center</b> .   |
| <b>decimalpoint</b>               | The string used to separate the integral part of a number from the fractional part. Used in <a href="#">N</a> -classified columns.<br><br><i>Default:</i> <b>"."</b>   |
| <b>doublebox</b> ,<br>doubleframe | Like <a href="#">box</a> , but also draw a second line around the entire table if <b>true</b> .<br><br><i>Default:</i> <b>false</b>  |
| <b>font</b>                       | The font for the table. Can be overridden later by the <b>TK</b> column modifier.<br><br><i>Default:</i> <b>"Times"</b>  |
| <b>header-rows</b>                | The number of rows at the beginning of the table to consider part of the “header” for the purposes of <a href="#">repeat-header</a> . This option is also controlled by <b>.TH</b> rows in the table data.<br><br><i>Default:</i> <b>1</b> |

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|                                   |   |
|-----------------------------------|---|
| <b>macros</b>                     | <p>A dictionary of (name, function) pairs that can be used with column modifier <b>TK</b>.</p> <p><i>Default:</i> <b>(:)</b></p>  |
| <b>repeat-header</b>              | <p>If <b>breakable</b> is <b>true</b> and this option is <b>true</b>, then the table header controlled by <b>header-rows</b> will be re-displayed on each subsequent page. This option is also controlled by <b>.TH</b> rows in the table data.</p> <p><i>Default:</i> <b>false</b></p> |
| <b>stroke,</b><br><b>linesize</b> | <p>How to draw all lines in the table.</p> <p><i>Default:</i> <b>1pt</b></p>  |
| <b>tab</b>                        | <p>The string delimiter that separates different cells within a given row of the table data.</p> <p><i>Default:</i> <b>"\t"</b> (a TAB character)</p>   |
| <b>tbl-align</b>                  | <p>How to align the table as a whole.</p> <p><i>Default:</i> <b>left</b></p>  |

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# Format specifications

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The format specifications section controls the layout and style of cells within rows and columns of the table.

Each comma or new line of format specification begins a new *row definition*. Within each row definition, encountering a *column classifier* character denotes a new column in the table. The classifier may be followed by any number of *column modifiers*, some of which may have required arguments enclosed in parentheses.

The following column classifiers are recognized. They may be given as either capital or lowercase.

|   |  |
|---|--|
| <b>L</b>                                    | Left align.  |
| <b>R</b>                                    | Right align.   |
| <b>C</b>                                    | Center align.  |
| <b>N</b>                                    | Numerically align.   |
| <b>S</b>                                    | This cell is column-spanned by the previous cell to the left in the current row.<br><br><i>The corresponding table data entries should be empty.</i>   |
| <b>^</b> (caret)                            | This cell is row-spanned by the corresponding cell in the previous row above.<br><br><i>The corresponding table data entries should be empty.</i>  |
| <b>_</b> (underscore),<br><b>-</b> (hyphen) | This cell contains a vertically-centered horizontal rule.<br><br><i>The corresponding table data entries should be empty.</i>  |
| <b>=</b> (equals sign)                      | Same as <b>_</b> , but draw a double horizontal rule instead.<br><br><i>The corresponding table data entries should be empty.</i>  |
| <b> </b> (vertical bar)                     | This classifier does not actually begin a new column, but rather indicates the location of a vertical line.<br><br>If placed at the beginning of a row definition, the line is drawn to the left of the first cell in that row. Otherwise, it is drawn to the right of the current cell in that row. |

# Data

---

# Examples

**Example 1:** adapted from [4]

```
``tbl
lz s | rt
lt| cb| ^
^ | rz s.
left||r
l|center|
|right
``
```

|      |        |       |
|------|--------|-------|
| left |        | r     |
| l    | center |       |
|      |        | right |

**Example 2:** adapted from [5, p. 41]

```
``tbl
c c c
l l ne .
Fact|Location|Statistic
Largest state|Alaska|591,004 sq. mi.
Smallest state|Rhode Island|1,212 sq. mi.
Longest river|Mississippi-Missouri|3,710 mi.
Highest mountain|Mount McKinley, AK|20,320 ft.
Lowest point|Death Valley, CA|-- 282 ft.
``
```

| Fact             | Location             | Statistic       |
|------------------|----------------------|-----------------|
| Largest state    | Alaska               | 591,004 sq. mi. |
| Smallest state   | Rhode Island         | 1,212 sq. mi.   |
| Longest river    | Mississippi-Missouri | 3,710 mi.       |
| Highest mountain | Mount McKinley, AK   | 20,320 ft.      |
| Lowest point     | Death Valley, CA     | – 282 ft.       |

**Example 3:** adapted from [4]

```
``tbl
r| l
r n.
software|version
—
AFL|2.39b
Mutt|1.8.0
Ruby|1.8.7.374
TeX Live|2015
``
```

| software | version   |
|----------|-----------|
| AFL      | 2.39b     |
| Mutt     | 1.8.0     |
| Ruby     | 1.8.7.374 |
| TeX Live | 2015      |



**Example 4:** adapted from [5, p. 43]

|                      |                   |     |                   |
|----------------------|-------------------|-----|-------------------|
| Composition of Foods |                   |     |                   |
| Food                 | Percent by Weight |     |                   |
|                      | Protein           | Fat | Carbo-<br>hydrate |
| Apples               | .4                | .5  | 13.0              |
| Halibut              | 18.4              | 5.2 | ...               |
| Lima beans           | 7.5               | .8  | 22.0              |
| Milk                 | 3.3               | 4.0 | 5.0               |
| Mushrooms            | 3.5               | .4  | 6.0               |
| Rye bread            | 9.0               | .6  | 52.7              |

**Example 5:** adapted from [5, p. 42]

|                        |                        |        |
|------------------------|------------------------|--------|
| Major New York Bridges |                        |        |
| Bridge                 | Designer               | Length |
| Brooklyn               | J . A . Roebling       | 1595   |
| Manhattan              | G . Lindenthal         | 1470   |
| Williamsburg           | L . L . Buck           | 1600   |
| Queensborough          | Palmer &<br>Hornbostel | 1182   |
| Triborough             | O . H . Ammann         | 1380   |
|                        |                        | 383    |
| Bronx Whitestone       | O . H . Ammann         | 2300   |
| Throgs Neck            | O . H . Ammann         | 1800   |
| George Washington      | O . H . Ammann         | 3500   |

**Example 6:** adapted from [4]

```

```tbl
rb c lb
r ci l.
r|center|l
ri|ce|le
right|c|left
```

```

|       |        |      |
|-------|--------|------|
| r     | center | l    |
| ri    | ce     | le   |
| right | c      | left |

**Example 7:** adapted from [3]

```

```tbl
Cf(BI) Cf(BI) Cf(B), C C Cu.
n|n*#sym.times;*n|difference
1|1
2|4|3
3|9|5
4|16|7
5|25|9
6|36|11
```

```

| $n$ | $n \times n$ | difference |
|-----|--------------|------------|
| 1   | 1            | 3          |
| 2   | 4            | 5          |
| 3   | 9            | 7          |
| 4   | 16           | 9          |
| 5   | 25           | 11         |
| 6   | 36           |            |

**Example 8:** adapted from [5, p. 42]

```

```tbl
c c
np(-2) | n | .
|Stack
|_
1|46
|_
2|23
|_
3|15
|_
4|6.5
|_
5|2.1
|_
```

```

|   | Stack |
|---|-------|
| 1 | 46    |
| 2 | 23    |
| 3 | 15    |
| 4 | 6.5   |
| 5 | 2.1   |

**Example 9:** adapted from [5, p. 37]

```

```tbl
n.
13
4.2
26.4.12
26.4. 12
26.4 .12
abc
abc\&
43\&3.22
749.12
```

```

|          |
|----------|
| 13       |
| 4.2      |
| 26.4.12  |
| 26.4. 12 |
| 26.4 .12 |
| abc      |
| abc      |
| 433.22   |
| 749.12   |

**Example 10:** adapted from [5, p. 41]

```

```tbl
c s s
c c c
n n ne .
AT&T Common Stock
Year|Price|Dividend
1984|15-20|\$1.20
5|19-25|1.20
6|21-28|1.20
7|20-36|1.20
8|24-30|1.20
9|29-37|.30\*
```

```

| AT&T Common Stock |       |          |
|-------------------|-------|----------|
| Year              | Price | Dividend |
| 1984              | 15-20 | \$1.20   |
| 5                 | 19-25 | 1.20     |
| 6                 | 21-28 | 1.20     |
| 7                 | 20-36 | 1.20     |
| 8                 | 24-30 | 1.20     |
| 9                 | 29-37 | .30*     |

**Example 11**

```

```tbl
cb cb
c c.
Grade|Points
A|510
B|450
C|390
D|330
```

```

| Grade | Points |
|-------|--------|
| A     | 510    |
| B     | 450    |
| C     | 390    |
| D     | 330    |

**Example 12:** adapted from [5, p. 44]

```

```tbl
cf(I) s s
c cw(1in) cw(1in)
ltp(9) ltp(9) ltp(9).
New York Area Rocks
Era|Formation|Age (years)
Precambrian|Reading Prong|>1 billion
Paleozoic|Manhattan Prong|400 million
Mesozoic|T{
#set text(hyphenate: true, overhang: true)
Newark Basin, incl.
Stockton, Lockatong, and Brunswick
formations; also Watchungs
and Palisades.
T}|200 million
Cenozoic|Coastal Plain|T{
#set text(hyphenate: true, overhang: true)
#set par(justify: true)
On Long Island 30,000 years;
Cretaceous sediments redeposited
by recent glaciation.
T}
```

```

| <i>New York Area Rocks</i> |  |   |
|----------------------------|--|---|
| Era                        | Formation  | Age (years)   |
| Precambrian                | Reading Prong  | >1 billion  |
| Paleozoic                  | Manhattan Prong  | 400 million   |
| Mesozoic                   | Newark Basin,<br>incl. Stockton,<br>Lockatong, and<br>Brunswick forma-<br>tions; also<br>Watchungs and<br>Palisades. | 200 million   |
| Cenozoic                   | Coastal Plain  | On Long Island<br>30,000 years; Cre-<br>taceous sediments<br>redeposited by re-<br>cent glaciation. |

**Example 13:** adapted from [4]

```

```tbl
le le7| lw(10).
The fourth line|_|line 1
of this column|=|line 2
determines|_|line 3
the column width.|T{
This text is too wide to fit into a column of width 17.
T}|line 4
T{
No break here.
T}|line 5
```

```

|                   |  |        |
|-------------------|--|--------|
| The fourth line   |  | line 1 |
| of this column    |  | line 2 |
| determines        |  | line 3 |
| the column width. | This text is too wide to fit into a<br>column of width 17. | line 4 |
| No break here.    |  | line 5 |

**Example 14:** adapted from [5, p. 45]

```

```tbl
cb s s s s
cp(-2) s s s s
c | c | c | c | c
c | c | c | c | c
r2 | n2 | n2 | n2e | nbe.
Readability of Text
Line Width and Leading for 10-Point Type
-
Line : Set : 1-Point : 2-Point : 4-Point
Width : Solid : Leading : Leading : Leading
-
9 Pica : 93 : --6.0 : --5.3 : --7.1
14 Pica : 450 : --0.6 : --0.3 : --1.7
19 Pica : 5 : --5.1 : 0.0 : --2.0
31 Pica : 3 : --3.8 : --2.4 : --3.6
43 Pica : 5.1 : --90000.000 : --5.9 : --8.8
```

```

| Readability of Text                      |           |                 |                 |                 |
|--|-----------|-----------------|-----------------|-----------------|
| Line Width and Leading for 10-Point Type |           |                 |                 |                 |
| Line Width                               | Set Solid | 1-Point Leading | 2-Point Leading | 4-Point Leading |
| 9 Pica                                   | 93        | -6.0            | -5.3            | -7.1            |
| 14 Pica                                  | 450       | -0.6            | -0.3            | -1.7            |
| 19 Pica                                  | 5         | -5.1            | 0.0             | -2.0            |
| 31 Pica                                  | 3         | -3.8            | -2.4            | -3.6            |
| 43 Pica                                  | 5.1       | -90000.000      | -5.9            | -8.8            |

# References

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- [1] <https://typst.app/>
- [2] Pg Biel, “Typst-tablex.” <https://github.com/PgBiel/typst-tablex>
- [3] <https://man7.org/linux/man-pages/man1/tbl.1.html>
- [4] <https://man.openbsd.org/tbl.7>
- [5] L. L. Cherry, and M. E. Lesk, “Tbl – a program to format tables,” in *Unix Res. System*, A. G. Hume, and M. D. McIlroy, Eds., vol. 2, 10th ed., Murray Hill, New Jersey 07974: Holt Rinehart & Winston, pp. 35–51. [Online]. Available: <https://9p.io/10thEdMan/tbl.pdf>