

LaTeXcel Package

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Contents

1	Introduction	2
2	Environments and Colours	3
3	Options	3
4	Examples	6
4.1	Default	6
4.2	Background Colours	7
4.3	Text Formatting	8
4.4	Padding and Cell Addresses	9
4.5	Cell Sizing	11
4.6	Borders	12
4.7	Highlighting a Cell	15

Introduction

This package provides an environment which mimics the appearance of a spreadsheet. It is modeled after the Google Sheets interface, but is also very similar to that of Excel. It is best seen with an example (alignment in the source code is purely for readability):

```
1 \begin{latexcel}[
2   selected cell      = {1,4},
3   header cell style  = \color{white}\textbf,
4   header row color   = Sheets_Blue,
5   odd row color      = Sheets_PaleBlue,
6 ]
7   Name              & Age   & City              \\
8 % |-----|-----|-----|
9   John Smith        & 28   & New York          \\
10  Alice Johnson      & 35   & Los Angeles       \\
11  Bob Anderson       & 22   & Chicago           \\
12  Eva Williams       & 30   & San Francisco     \\
13  David Brown        & 25   & Miami
14 \end{latexcel}
```

The screenshot shows a spreadsheet interface with a formula bar at the top displaying 'B5' and 'fx Bob Anderson'. Below the formula bar is a table with columns labeled A, B, C, D, and E. The data is organized as follows:

	A	B	C	D	E
1					
2		Name	Age	City	
3		John Smith	28	New York	
4		Alice Johnson	35	Los Angeles	
5		Bob Anderson	22	Chicago	
6		Eva Williams	30	San Francisco	
7		David Brown	25	Miami	
8					

The package is loaded as normal with `\usepackage{latexcel}`. It relies on the following packages:

- `tikz` for all graphical elements
- `xcolor` for colours
- `environ` for the environment

- \LaTeX syntax, for all options and content processing

Note that, since the graphics are rendered by \LaTeX , the font used will significantly impact the appearance of the tables. Of particular note, the “ \LaTeX ” in the formula bar may appear strange in certain fonts. In this document, the **Fira Sans** and **Fira Mono** fonts are used, which are freely available on CTAN. The Helvetica font is also a very close match to the Arial font used by default in Google Sheets.

Environments and Colours

The package provides a single environment, `latexcel`, which takes one optional argument; a comma-separated list of key-value pairs. These are detailed in the next section. The contents of the environment should follow the same syntax as a `tabular` environment: lines delimited by a double backslash (`\`), and columns delimited by an ampersand (`&`). The final line should **not** be terminated with a double backslash.

In addition to the `latexcel` environment, the package provides a number of colours which mimic those used in Google Sheets. These are shown in Table 1.









Name	Example	Alias
SheetsOrange	A1:B3 	Sheets1
SheetsPurple	A1:B3 	Sheets2
SheetsCyan	A1:B3 	Sheets3
SheetsMaroon	A1:B3 	Sheets4
SheetsBlue	A1:B3 	Sheets5
SheetsYellow	A1:B3 	Sheets6
SheetsGreen	A1:B3 	Sheets7
SheetsBrown	A1:B3 	Sheets8

Table 1: The colours provided by the `latexcel` package. These are in the same order in which Google sheets will apply them to cell ranges in formulae.

Options

The `latexcel` environment takes a number of options, which are described below. These options are passed as a set of comma-separated key-value pairs to the `latexcel` environment. The option is given on the left, below which is the default (the value used if the option is not specified), and the initial value (if any) is given in brackets; this is the value used if the option is specified but no value is given.

Note: all options which use colours use the US spelling “color” rather than the UK spelling “colour” which is used in the *text* of this documentation.

`row height` | Accepts any float, which is interpreted as a height in centimetres. This sets the height of all cells in the table, including headers. It is not possible to set the height of individual rows.

<code>padding rows</code> 1	Accepts any non-negative integer. This sets the number of additional rows rendered before and after the table. Be sure that this and the <code>starting row</code> option are set appropriately to avoid unexpected row numbering – they are not checked for consistency.
<code>padding row height</code> 0.65	Accepts any float, which is interpreted as a height in centimetres. This sets the height of the padding rows.
<code>starting row</code> 2	Accepts any positive integer. This sets the number of the first row in the table (the header row). This is absolute, so padding row numbering is calculated relative to this value. If the number of padding rows is greater than or equal to this value, some padding rows will be rendered with row numbers less than 1.
<code>column width</code> 4	Accepts any float, which is interpreted as a width in centimetres. This sets the width of all columns in the table. It is not possible to set the width of individual columns.
<code>padding columns</code> 1	Accepts any non-negative integer. This sets the number of additional columns rendered before and after the table. Be sure that this and the <code>starting column</code> option are set appropriately to avoid unexpected column numbering – they are not checked for consistency.
<code>padding column width</code> 0.65	Accepts any float, which is interpreted as a width in centimetres. This sets the width of the padding columns.
<code>starting column</code> 2	Accepts any positive integer. This sets the index of the first column in the table (the left-most column). Column indices are rendered as letters (in the style of Excel or Google Sheets), with 1 corresponding to A. This is absolute, so padding column numbering is calculated relative to this value. If the number of padding columns is greater than or equal to this value, some padding columns will be rendered with column indices less than 1. This will result in unexpected characters being rendered as part of the table. It is vital to avoid this.
<code>cell style</code> {}	Accepts a comma-separated list of commands to apply to the non-header cell content, cell by cell. This can be empty, a single value, or multiple values. If the number of styles is less than the number of columns, the styles are repeated, allowing for (for example) alternating styles. The final token in each style may take the content of the cell as an argument, for example <code>\textbf</code> is acceptable.
<code>every cell style</code> {}	Accepts any commands (not a list of commands), to be applied to every non-header cell, after any cell-specific styles specified in <code>cell style</code> . The final token in <code>every cell style</code> may take the cell contents as an argument, after any cell-specific styles have been applied. In effect, the order is <code>\everycellstyle{\cellstyle{cell contents}}</code> . This allows for styling specified in <code>cell style</code> to overwrite the styling specified in <code>every cell style</code> .
<code>header cell style</code> {}	Accepts a comma-separated list of commands to apply to the header cell content, cell by cell. This can be empty, a single value, or multiple values. If the number of styles is less than the number of columns, the styles are repeated, allowing for (for example) alternating styles. The final token in each style may take the content of the header as an argument, for example <code>\textbf</code> is acceptable.

<code>every header cell style {}</code>	Accepts any commands (not a list of commands), to be applied to every header cell, after any cell-specific styles specified in <code>header cell style</code> . The final token in <code>every header cell style</code> may take the header cell contents as an argument, after any cell-specific styles have been applied. In effect, the order is <code>\everyheadercellstyle{\headercellstyle{header cell contents}}</code> . This allows for styling specified in <code>header cell style</code> to overwrite the styling specified in <code>every header cell style</code> .
<code>header row color white</code>	Accepts any colour, including colour combinations such as <code>blue!50!white</code> . This sets the background colour of the header cells.
<code>even row color white</code>	Accepts any colour, including colour combinations such as <code>blue!50!white</code> . This sets the background colour of the even-numbered rows.
<code>odd row color white</code>	Accepts any colour, including colour combinations such as <code>blue!50!white</code> . This sets the background colour of the odd-numbered rows.
<code>borders true (true)</code>	Boolean. If <code>true</code> , borders are rendered around the table and between columns and rows according to <code>row borders</code> and <code>column borders</code> . If <code>false</code> , no borders are rendered, overwriting the values of <code>row borders</code> and <code>column borders</code> .
<code>row borders false (true)</code>	Boolean. If <code>true</code> , borders are rendered between rows. If <code>false</code> , no borders are rendered between rows, except for the header row. Borders are always rendered on the outside of the table, unless <code>borders = false</code>
<code>column borders true (true)</code>	Boolean. If <code>true</code> , borders are rendered between columns. If <code>false</code> , no borders are rendered between columns. Borders are always rendered on the outside of the table, unless <code>borders = false</code>
<code>border style {}</code>	Accepts any valid tikz style, such as <code>"dashed, draw = red"</code> . This sets the style of the borders, appended to a default style of <code>"line width = <width>, black"</code> , where <code><width></code> is specified by the <code>border width</code> option.
<code>border width 0.75pt</code>	Accepts any \TeX dimension, such as <code>1mm</code> or <code>0.5pt</code> . This sets the line width of the borders.
<code>selected cell {}</code>	Accepts a comma-separated pair of integers, which specify the row and column of the selected cell within the table; i.e. such that the first header is <code>{1,1}</code> . Padding cells can be selected, but setting this value to a cell which is not rendered (i.e, not within the table and not within the padding rows or columns) will throw an error. This is not checked internally. The selected cell will be highlighted, and its contents displayed in the formula bar if <code>formula</code> is not set.
<code>formula {}</code>	Accepts a token list (i.e, standard \TeX syntax) to be displayed in the formula bar. This is prepended by an equals sign, and rendered in the <code>\ttfamily</code> font. If this is not set, the contents of the selected cell are displayed instead.
<code>show formula bar true (true)</code>	Boolean. If <code>true</code> , the formula bar is rendered, including the formula. If <code>false</code> , the entire formula bar is not rendered, and the picture stops at the top of the column labels.
<code>scale 1</code>	Accepts any float. This scales the entire picture by the given factor using a <code>scalebox</code> .

Examples

Default

With no options specified, the table is rendered as follows:

```
1 \begin{latexcel}
2   Name      & Age  & City      \\
3   John Smith & 28   & New York  \\
4   Alice Johnson & 35   & Los Angeles \\
5   Bob Anderson & 22   & Chicago   \\
6   Eva Williams & 30   & San Francisco \\
7   David Brown  & 25   & Miami     \\
8 \end{latexcel}
```

B2

fx

	A	B	C	D	E
1					
2		Name	Age	City	
3		John Smith	28	New York	
4		Alice Johnson	35	Los Angeles	
5		Bob Anderson	22	Chicago	
6		Eva Williams	30	San Francisco	
7		David Brown	25	Miami	
8					

Background Colours

Background colours can be specified for the header row, and for odd and even rows separately. The example below uses the colours from the Rosé Pine Dawn palette, which can be found here: <https://rosepinetheme.com>. The option `header cell style` is also used to set the header text to an appropriate colour.

```
1 \begin{latexcel}[
2   header cell style   = \color{BackgroundColour}\textbf,
3   cell style          = \color{ForegroundColour},
4   header row color    = Blue,
5   even row color      = BackgroundColour,
6   odd row color       = Surfaces5
7 ]
8   Name                & Age   & City                \\
9 % |-----|-----|-----|
10  John Smith          & 28   & New York            \\
11  Alice Johnson       & 35   & Los Angeles        \\
12  Bob Anderson        & 22   & Chicago             \\
13  Eva Williams        & 30   & San Francisco      \\
14  David Brown         & 25   & Miami
15 \end{latexcel}
```

B2 | fx

	A	B	C	D	E
1					
2		Name	Age	City	
3		John Smith	28	New York	
4		Alice Johnson	35	Los Angeles	
5		Bob Anderson	22	Chicago	
6		Eva Williams	30	San Francisco	
7		David Brown	25	Miami	
8					

Text Formatting

The formatting for the text in cells can be specified using `cell style` and `every cell style` for non-header cells, and `header cell style` and `every header cell style` for header cells. The “every” variant is applied to each cell, while the non-“every” variant can be used to specify formatting for each column individually, and overrides the “every” variant. The example below makes use of the `siunitx` package to format the numbers in the table with units.

```
1 % Declare a new SI unit for year
2 \DeclareSIUnit{\year}{yr}
3
4 \newcommand{\formatAge}[1]{
5   \SI{#1}{\year}
6 }
7
8 \begin{latexcel}[
9   header cell style = \textbf,
10  every cell style  = \color{blue},
11  cell style        = {}, {\formatAge}, \ttfamily,
12 ]
13   Name           & Age   & City           \\
14 % |-----|-----|-----|
15   John Smith    & 28   & New York       \\
16   Alice Johnson & 35   & Los Angeles    \\
17   Bob Anderson  & 22   & Chicago        \\
18   Eva Williams  & 30   & San Francisco  \\
19   David Brown   & 25   & Miami          \\
20 \end{latexcel}
```

B2 ▾ <i>fx</i>					
	A	B	C	D	E
1					
2		Name	Age	City	
3		John Smith	28 yr	New York	
4		Alice Johnson	35 yr	Los Angeles	
5		Bob Anderson	22 yr	Chicago	
6		Eva Williams	30 yr	San Francisco	
7		David Brown	25 yr	Miami	
8					

Padding and Cell Addresses

The `padding rows` and `padding columns` options can be used to specify the number of additional rows and columns to render before and after the table. Setting this to at least 1 helps to sell the rendered picture as a genuine extract from Google Sheets, but it is not necessary. The example below includes no padding rows or columns, with the table starting at the cell `A1`.

```
1 \begin{latexcel}[
2   padding rows = 0,
3   padding columns = 0,
4   starting row = 1,
5   starting column = 1,
6 ]
7   Name           & Age   & City           \\
8 % |-----|-----|-----|
9   John Smith     & 28   & New York       \\
10  Alice Johnson  & 35   & Los Angeles    \\
11  Bob Anderson   & 22   & Chicago        \\
12  Eva Williams   & 30   & San Francisco  \\
13  David Brown    & 25   & Miami          \\
14 \end{latexcel}
```

A1	A	B	C
1	Name	Age	City
2	John Smith	28	New York
3	Alice Johnson	35	Los Angeles
4	Bob Anderson	22	Chicago
5	Eva Williams	30	San Francisco
6	David Brown	25	Miami

In the example below, the table starts at `F3`, with 2 padding columns and 1 padding row. Note that the row and column numbering is absolute, so the padding rows and columns are numbered relative to the starting row and column. This means that the labelled columns start at `D` and the labelled rows start at `2`.

```

1 \begin{latexcel}[
2   padding columns = 2,
3   starting row = 3,
4   starting column = 6
5 ]
6   Name           & Age   & City           \\
7 % |-----|-----|-----|
8   John Smith     & 28   & New York       \\
9   Alice Johnson  & 35   & Los Angeles    \\
10  Bob Anderson   & 22   & Chicago        \\
11  Eva Williams   & 30   & San Francisco  \\
12  David Brown    & 25   & Miami
13 \end{latexcel}

```

F3							
	D	E	F	G	H	I	J
2							
3			Name	Age	City		
4			John Smith	28	New York		
5			Alice Johnson	35	Los Angeles		
6			Bob Anderson	22	Chicago		
7			Eva Williams	30	San Francisco		
8			David Brown	25	Miami		
9							

Cell Sizing

Cell sizes can be specified for the table cells and the padding cells separately, always in centimetres. The example below uses a smaller row height than the default for the table cells, and a wider column width for the padding cells. The `scale` option can also be used to scale the entire picture; here, it is used to shrink the picture to 80% of its original size.

```
1 \begin{latexcel}[
2   row height = 0.65,
3   padding column width = 1,
4   scale = 0.8,
5 ]
6   Name          & Age   & City          \\
7 % |-----|-----|-----|
8   John Smith    & 28   & New York      \\
9   Alice Johnson & 35   & Los Angeles   \\
10  Bob Anderson  & 22   & Chicago       \\
11  Eva Williams  & 30   & San Francisco \\
12  David Brown   & 25   & Miami
13 \end{latexcel}
```

B2 ▾ fx					
	A	B	C	D	E
1					
2		Name	Age	City	
3		John Smith	28	New York	
4		Alice Johnson	35	Los Angeles	
5		Bob Anderson	22	Chicago	
6		Eva Williams	30	San Francisco	
7		David Brown	25	Miami	
8					

Borders

By default, the table will include a border around the entire table, as well as between the columns and to separate the header row from the table body. Passing `borders = false` will remove all borders, overriding all other border options. This is shown below, with some background colours.

```
1 \begin{latexcel}[
2   borders           = false,
3   header row color  = Blue,
4   header cell style = \color{BackgroundColour}\textbf,
5   cell style        = \color{ForegroundColour},
6   even row color    = BackgroundColour,
7   odd row color     = Surface5
8 ]
9   Name              & Age   & City              \\
10  % |-----|-----|-----|
11   John Smith       & 28   & New York          \\
12   Alice Johnson    & 35   & Los Angeles       \\
13   Bob Anderson     & 22   & Chicago            \\
14   Eva Williams     & 30   & San Francisco     \\
15   David Brown      & 25   & Miami              \\
16 \end{latexcel}
```

B2					
	A	B	C	D	E
1					
2		Name	Age	City	
3		John Smith	28	New York	
4		Alice Johnson	35	Los Angeles	
5		Bob Anderson	22	Chicago	
6		Eva Williams	30	San Francisco	
7		David Brown	25	Miami	
8					

Row borders and column borders can be enabled or disabled separately. The example below shows both in their non-default state.

```

1 \begin{latexcel}[
2   column borders      = false,
3   row borders        = true,
4   header row color    = Blue,
5   header cell style   = \color{BackgroundColour}\textbf,
6   cell style          = \color{ForegroundColour},
7   even row color      = BackgroundColour,
8   odd row color       = Surface5
9 ]
10 Name           & Age   & City           \\
11 % |-----|-----|-----|
12 John Smith     & 28   & New York       \\
13 Alice Johnson  & 35   & Los Angeles    \\
14 Bob Anderson   & 22   & Chicago        \\
15 Eva Williams   & 30   & San Francisco  \\
16 David Brown    & 25   & Miami          \\
17 \end{latexcel}

```

B2					
	A	B	C	D	E
1					
2		Name	Age	City	
3		John Smith	28	New York	
4		Alice Johnson	35	Los Angeles	
5		Bob Anderson	22	Chicago	
6		Eva Williams	30	San Francisco	
7		David Brown	25	Miami	
8					

The border styling can be specified with the `border` style option. This option is passed to the `tikz draw` command, so any valid `tikz` styling can be used. It is appended to “`line width = <width>, black`” (where `<width>` is specified with the `border width` option), so it can override these options if desired. The example below uses a dashed line of a different colour. Additionally, the option `border width` is used to increase the width of the borders.

```

1 \begin{latexcel}[
2   header row color    = Blue,
3   header cell style   = \color{BackgroundColour}\textbf,
4   cell style          = \color{ForegroundColour},
5   even row color      = BackgroundColour,
6   odd row color       = Surface5,
7   border style        = {densely dashed, Red},
8   border width        = 1mm,
9 ]
10  Name           & Age   & City           \\
11 % |-----|-----|-----|
12  John Smith     & 28   & New York       \\
13  Alice Johnson  & 35   & Los Angeles    \\
14  Bob Anderson   & 22   & Chicago        \\
15  Eva Williams   & 30   & San Francisco  \\
16  David Brown    & 25   & Miami          \\
17 \end{latexcel}

```

B2					
	A	B	C	D	E
1					
2		Name	Age	City	
3		John Smith	28	New York	
4		Alice Johnson	35	Los Angeles	
5		Bob Anderson	22	Chicago	
6		Eva Williams	30	San Francisco	
7		David Brown	25	Miami	
8					

Highlighting a Cell

The `selected cell` option can be used to highlight a cell, and display its contents in the formula bar. The example below highlights the cell **D3**, which is in the 3rd column and 2nd row of the table. The coordinates are 1-indexed, starting from the top-left cell of the table (i.e, the first header cell). Note that the cell contents are displayed in the formula bar, as well as the selected cell address in the top left.

```
1 \begin{latexcel}[
2   selected cell = {3, 2}
3 ]
4   Name           & Age   & City           \\
5 % |-----|-----|-----|
6   John Smith     & 28   & New York       \\
7   Alice Johnson  & 35   & Los Angeles    \\
8   Bob Anderson   & 22   & Chicago        \\
9   Eva Williams   & 30   & San Francisco  \\
10  David Brown    & 25   & Miami          \\
11 \end{latexcel}
```

D3		fx New York			
	A	B	C	D	E
1					
2		Name	Age	City	
3		John Smith	28	New York	
4		Alice Johnson	35	Los Angeles	
5		Bob Anderson	22	Chicago	
6		Eva Williams	30	San Francisco	
7		David Brown	25	Miami	
8					