

# YAMLvars

a YAML variable parser for LuaLaTeX

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YAMLvars is a LuaLaTeX-based package to help make definitions or produce LaTeX code using a YAML file. This package might be useful for you if you want to batch create documents by pushing various sets of YAML data to a fixed LaTeX template, or just find it easier to read document metadata from a YAML file compared to the standard `title`, `author`, etc. commands.

## 1 Package Options

**parseCLI** If this option is enabled, any arguments passed to your `lualatex` compile command that end in `“.yaml”` will be used, separated by a space. If two `yaml` files are passed, the first one will be the declaration file, and the second will be the parsing file. They will be used at the beginning of the document. If one `yaml` file is passed, it will be treated as a parsing file, so you should declare the variables somewhere in the preamble. This option is offered to help with automation scripts. An example is shown in Section 9.

**allowundeclared** It might be helpful to define something in your YAML parsing doc without declaring it. If you want this flexibility, use this setting. Note that existing definitions will not be overwritten and an error will be thrown if the name exists. Alternatively, you can use the commands `\AllowUndeclaredYV` or `\ForbidUndeclaredYV` to toggle this behavior.

**overwritedefs** Danger! This will allow you to `gdef` commands with YAML. Caution should be taken to not set definitions like `begin`, `section`, etc.

**useyv** By default, when you specify a YAML variable, it will be defined using `gdef` (only if it wasn't defined previously). If you use this setting, unless otherwise specified, YAML variables will be accessible under the `\yv{<var>}` command. Note that internally, the variables are stored in the command sequence `\yv <var>`.

## 2 Dependencies

**Note:** This package requires the `tinyyaml` package, available on CTAN.

The distribution: <https://github.com/api7/luatinyyaml>

<https://ctan.org/pkg/luatinyyaml>

The YAML specification: <https://yaml.org/spec/>

Many of the “transform” and “processing” functions built-in to this package rely on other packages, like `hyperref`, or `xspace` for example, but they are not loaded, and this package will only load `penlightplus`, `luacode`, `luakeys`, and `etoolbox`.

## 3 Settings

`\setdefYAMLvars {kv}` changes the default settings of key-vals.

`\setYAMLvars *{kv}` changes the current settings from key-vals. Use `*` if you want to first restore to defaults.

The `YAMLvars.setts` lua table contains the settings, which are:

`parseopts` table passed to YAML parser options (default is `{timestamps=false}`)

`decstr` in the declaration YAML text, if a value is a string, how should it be treated (`xfm`, `dft`, or `prc`)

`undeclared` boolean for allowing parsing of undeclared vars

`overwrite` boolean for allowing overwriting of previous definitions

`lowercase` boolean for auto-changing vars to lowercase

`prcstring` boolean for auto-converting final value before processing (sometimes) numbers can have odd effects

`xfm` default `xfm` function(s) if none passed to declared key, separated by space

`prc` default `prc` function if none passed to declared key

`dft` default `dft` function if none passed to declared key

## 4 Declaring variables

A declaration file can either be parsed with the command `declareYAMLvarsFile` command, or, if you want to do it  $\LaTeX$ , you can put the YAML code in the `declareYAMLvars` environment. It is a declaring YAML document is (like all YAML) key-value dictionary: The top level key is the name of the variable to be defined/used. If the value of the top level is a string: it’s interpreted as a single transform function to be applied. Otherwise, it must be a table that contains at least one of the following keys:

`xfm` (transform, may be a string or list of strings),

`prc` (processing, must be a single string), or  
`dft` (default value, if being defined. Must be a string).

If you want to change the way a variable is initialized, you can change the function `YAMLvars.dec.PRC = function (var) ... end` where `PRC` is how the variable will be processed (`gdef`, `yvdef`, `length`, or something of your choosing).

The default value for variables is the Lua `nil`. `YAMLvars` will first check if the definition exists, if so, an error will be thrown so that we avoid overwriting. If the token is available, it is set to a package error, so that if the variable no defined later on, an error will tell the user they forgot to set it. This will be overwritten when you parse the variables and assign a value to it.

**If you want a case-insensitive variable** In the declaration YAML document, add a `lowcasevar: true` under the variable name. This will make the variable name lowercase before any transforms or processing is done. For example, if you have `title` as a YAML variable to set the `prc` function `setdocvar`, a user could write `Title` in the parsing file and still have it work. You can toggle this behaviour globally with the commands `\lowcasevarYVon` and `\lowcasevarYVoff` See the last example below.

You can change the default `xfm`, `prc`, or `dft` by changing the value (in Lua): `YAMLvars.xfmDefault = ''` etc.

Here is an example of a declaration document.

```
\begin{declareYAMLvars}
Location: addxspace           # sets xfm=addxspace
People: [arrsortlastnameAZ, list2nl] # BAD! don't do.
People:
  xfm: [arrsortlastnameAZ, list2nl] # Correct way
Company:
  dft: Amazon                  # Change default only
Revisions:
  dft: '1 & \today & initial version \\'
  xfm: [sortZA, list2tab]
Rhead:
  prc: setRightHead

author:
  xfm: list2and                # (joins a list with \and (or lets a single string be passed)
  prc: setdocvar # calls \author{val}
  lowcasevar: true            # allows user to use Title: or TITLE:

title:
```

```

    xfm: lb2nl      # (make line-breaks \\)
    prc: setdocvar # calls \title{val}
    lowercasevar: true # allows user to use Title: or TITLE:
\end{declareYAMLvars}

```

To change how a variable is declared (initialize), you can modify or add functions in `YAMLvars.dec` table, where the index is the same as the `prc` name. This function accepts two variables, the var name, and the default value set by `dft`. For lengths and toggles (from `etoolbox`), these functions are used to initialize lengths with `newlength` and `newtoggle`.

## 5 Parsing variables

A YAML file to be parsed will contain the variables as the top level keys, similar to declaring. The value can be anything you want; as long as you have applied appropriate transform and declaring functions to it so that it can be useful. For example, a value specified as a YAML list will first be interpreted as a Lua table (with numeric indexes/keys). You could declare a series of transforms functions to sort this table, map functions, and convert it to a series of `LATEX\items`.

Here is an example of a parsing document.

```

\begin{parseYAMLvars}
Location: Planet Earth
People:          # a YAML list
  - Some One     # turns into Lua table
  - No Body
# company assumed Amazon if not set here
Rhead: \today
\end{parseYAMLvars}

```

## 6 xfm – Transform Functions

These functions accept two arguments: (`var`, `val`) where `var` is the variable (or key) and `val` is the value. The transforms are specified as a list and are iteratively applied to the `val`. Usually, the final `xfm` function should produce a string so it can be defined.

Hint: if for some reason, your `xfm` and `prc` depends on other variables, you can access them within the function with `YAMLvars.varsvals`

## 6.1 Defining your own transform functions

After the package is loaded, you may add your function (somewhere in Lua) by adding it to the `YAMLvars.xfm` table. For example, if you wanted to wrap a variable's value with “xxx”, here's how you could do that.

```
function myfunction(var, val)
    return 'xxx'..val..'xxx'
end
YAMLvars.xfm['addmyfunction'] = myfunction
```

If you want to run some Lua code and write in your YAML file (weird idea, but maybe useful for one-off functions), you can do so by specifying a transform function with an `=` in it to make a lambda function. For example, a `xfm` equal to “`= '---'..x..'---`” would surround your YAML variable's value with em-dashes. You can access the variable name with this lambda function with `v`. If you want to just execute code (instead of settings `x = , use /`).

## 7 prc – Processing Functions

Like the transform functions, the processing function must accept `(var, val)`. Only one processing function is applied to the final `(var, val)` after the transforms are done.

This package includes `gdef` to set a definition, `yvdef` to define a variable under the `yv` command. `title`, `author`, `date` to set `\@title`, `\@author`, `\@date`, respectively

## 8 Some Examples

```
1  %! language = yaml
2  \begin{declareYAMLvars}
3  address:
4    xfm:
5      - list2nl
6      - = x..'!!!'
7  name: null
8
9  title:
10     xfm:
11       - lb2nl
12     # - / YAMLvars.prvcmd(↔
        titletext, YAMLvars.varsvals['↔
        atitle']:gsub('\n', ' ')..'↔
        xspace{')
13 \end{declareYAMLvars}
14
15 %! language = yaml
16 \begin{parseYAMLvars}
17 title: |-
18     A Multiline
19     Monumental Title!
20
21 name: Joe Smith
22 address:
23     - 1234 Fake St.
24     - City
25 \end{parseYAMLvars}
26
27 \title
28
29 %\titletext!
30
31 \name
32
33 \address
```

A Multiline  
Monumental Title!  
Joe Smith  
1234 Fake St.  
City!!!

## 9 Automation Example

Suppose you had a number of bills of sales in yaml format and wanted to produce some nice pdfs. The following code shows how this could be done.

## 9.1 The main tex template

```
%% main.tex
\documentclass{article}
\usepackage[paperheight=4in,paperwidth=3in,margin=0.25in]{geometry}
\usepackage[pl,func,extras]{penlight}
\usepackage[useyv,parseCLI]{YAMLvars} % using command line option to make files
\usepackage{hyperref}
\usepackage{xspace}
\usepackage{luacode}

\setlength{\parindent}{0ex}
\setlength{\parskip}{0.75em}

\begin{luacode*} -- adding a custom function, put hfill between k-v pairs
  function YAMLvars.xfm.kv2hfill(var, val)
    local t = {}
    for k, v in pairs(val) do
      t[#t+1] = k..'\\hfill '..tostring(v)
    end
    return t
  end
\end{luacode*}

%! language = yaml
\begin{declareYAMLvars}
Customer: addxspace
Date: addxspace
Items:
  xfm: [kv2hfill, arr2itemize]
\end{declareYAMLvars}

\begin{document}
  Bill of sale for: \hfill \yv{Customer}\\
  Purchased: \hfill \yv{Date}\\
  \begin{itemize}
    \item[] ITEM \hfill PRICE
    \yv{Items} % the yaml variable
    \begin{luacode*}
      totalcost = pl.tablex.reduce('+',
        pl.tablex.values(YAMLvars.varsvals['Items']), 0)
      tex.print('\\item[] TOTAL:\\hfill'..tostring(totalcost))
    \end{luacode*}
  \end{itemize}
\end{document}
```



```
\end{document}
```

## 9.2 The lua automation script

```
--automate.lua
for f in io.popen('dir .'):lines() do -- get all files and info in cwd
  local i, j = f:find('%S*%.yaml') -- find fnames
  if i ~= nil then
    f = f:sub(i,j) -- extract .yaml file name (no space in fname allowed)
    os.execute('lualatex -output-format=pdf main.tex '.. f)
                                -- compile w/ yaml file as arg
    local fnew = f:gsub('yaml', 'pdf') -- file name for output pdf
    os.remove(fnew) -- delete if it exists already
    os.rename('main.pdf', fnew) -- change main.pdf to same as yaml file name
  end
end
end
```

## 9.3 The yaml data files

```
# sale1.yaml
Customer: Someone Cold
Date: January 2, 2021
Items:
  Toque: 12
  Mitts: 5.6
  Boots: 80
```

```
# sale2.yaml
Customer: Someone Warm
Date: July 1, 2021
Items:
  Beer (24 pk): 24
  Sunscreen: 5
  Hat: 12
```

## 10 xfm, dec, prc functions (from yamllvars.lua)

```

1  -- xfm functions (transforms) -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- ←
2  function YAMLLvars.xfm.addxspace(var, val)
3      return val .. '\\xspace'
4  end
5
6  function YAMLLvars.xfm.tab2arr(var, val)
7      return pl.array2d.from_table(val)
8  end
9
10 function YAMLLvars.xfm.arrsort2ZA(var, val)
11     return pl.array2d.sortOP(val, pl.operator.strgt)
12 end
13
14 function YAMLLvars.xfm.addrule2arr(var, val)
15     return pl.array2d.map_slice2(_1..'\\\\\\\\'.. YAMLLvars.setts.←
16         tabmidrule..' ', val, 1,-1,-2,-1)
17 end
18
19 function YAMLLvars.xfm.arr2tabular(var, val)
20     return pl.array2d.toTeX(val)..'\\\\\\'
21 end
22
23 function YAMLLvars.xfm.list2items(var, val)
24     return pl.List(val):map('\\item ' .._1):join(' ')
25 end
26
27 YAMLLvars.xfm.arr2itemize = YAMLLvars.xfm.list2items
28
29 function YAMLLvars.xfm.arrsortAZ(var, val)
30     return pl.List(val):sort(pl.operator.strlt)
31 end
32
33 function YAMLLvars.xfm.arrsortZA(var, val)
34     return pl.List(val):sort(pl.operator.strgt)
35 end
36
37 local function complastname(a, b)
38     a = a:split(' ')
39     b = b:split(' ')
40     a = a[#a]
41     b = b[#b]
42     return a < b
43 end
44
45 function YAMLLvars.xfm.arrsortlastnameAZ(var, val)
46     val = pl.List(val):sort(complastname)
47     return val

```

```

46 end
47
48 function YAMLvars.xfm.list2nl(var, val)
49     if type(val) == 'string' then
50         return val
51     end
52     return pl.List(val):join('\n\n ')
53 end
54
55 function YAMLvars.xfm.list2and(var, val) -- for doc vars like ←
56     author, publisher
57     if type(val) == 'string' then
58         return val
59     end
60     return pl.List(val):join('\nand ')
61 end
62
63 function YAMLvars.xfm.lb2nl(var, val) --linebreak in text 2 newline↔
64     val, _ = val:gsub('\n', '\n\n ')
65     return val
66 end
67
68 function YAMLvars.xfm.lb2newline(var, val) --linebreak in text 2 ←
69     newline \n
70     val, _ = val:gsub('\n', '\n\n ')
71     return val
72 end
73 function YAMLvars.xfm.lb2par(var, val) --linebreak in text 2 new l
74     val, _ = val:gsub('\n%s*\n', '\npar ')
75     return val
76 end
77
78 function YAMLvars.xfm.lowercase(var, val)
79     return val:lower()
80 end
81
82
83 -- dec laration functions, -- -- -- -- -- -- -- -- -- -- -- -- ←
84     -- -- -- -- -- -- -- -- -- -- -- --
85 function YAMLvars.dec.gdef(var, dft)
86     YAMLvars.deccmd(var, dft)
87 end
88
89 function YAMLvars.dec.yvdef(var, dft)
90     YAMLvars.deccmd('yv'..var, dft)

```

```

91 end
92
93 function YAMLvars.dec.toggle(var, dft)
94     tex.print('\global\newtoggle{'.var..'})
95     YAMLvars.prc.toggle(var, dft)
96 end
97
98 function YAMLvars.dec.length(var, dft)
99     tex.print('\global\newlength{\'..var..'})
100     YAMLvars.prc.length(var, dft)
101 end
102
103
104
105 -- prc functions (processing) -- -- -- -- -- -- -- -- -- -- -- -- -- -- ←
    -----
106
107 function YAMLvars.prc.gdef(var, val)
108     --token.set_macro(var, val, 'global') -- old way, don't do as ←
        it will cause issues if val contains undef'd macros
109     pl.tex.defcmd(var, val)
110     YAMLvars.debugtalk(var..' = '..val, 'prc gdef')
111 end
112
113 function YAMLvars.prc.yvdef(var, val)
114     pl.tex.defcmd('yv'..var, val)
115     YAMLvars.debugtalk('yv'..var..' = '..val, 'prc yvdef')
116 end
117
118 function YAMLvars.prc.toggle(t, v) -- requires penlight extras
119     local s = ''
120     if pl.hasval(v) then
121         s = '\global\toggletrue{'.t..'}'
122     else
123         s = '\global\togglefalse{'.t..'}'
124     end
125     tex.print(s)
126     YAMLvars.debugtalk(s, 'prc toggle')
127 end
128
129 function YAMLvars.prc.length(t, v)
130     v = v or 'Opt'
131     local s = '\global\setlength{\global\'.t..'}'..'v..}'
132     tex.print(s)
133     YAMLvars.debugtalk(s, 'prc length')
134 end
135
136
137

```

```

138 function YAMLvars.prc.setATvar(var, val) -- set a @var directly: eg↔
      \gdef\@title{val}
139     pl.tex.defcmdAT('@'..var, val)
140 end
141
142
143 function YAMLvars.prc.setdocvar(var, val) -- call a document var \↔
      var{val} = \title{val}
144     -- YAML syntax options
145     -- k: v -> \k{v}
146     -- k:
147     --   v1: v2      -> \k[v2]{v1}
148     -- k: [v1, v2]  -> \k[v2]{v1}
149     -- k: [v1]      -> \k{v1}
150     if type(val) ~= 'table' then
151         tex.sprint('\@'..var..'{'..val..'}')
152     elseif #val == 0 then -- assume single k,v passed
153         for k,v in pairs(val) do
154             tex.sprint('\@'..var..'['..v..'']{'.k..'}')
155         end
156     elseif #val == 1 then
157         tex.sprint('\@'..var..'{'..val[1]..'}')
158     else
159         tex.sprint('\@'..var..'['..val[2]..'']{'.val[1]..'}')
160     end
161 end
162
163
164 function YAMLvars.prc.setPDFdata(var, val)
165     --update pdf meta data table (via penlight), uses pdfx xmpdata
166     -- requires a table input
167     for k, v in pairs(val) do
168         if type(v) == 'table' then
169             v = pl.List(v):join('\sep ')
170         end
171         pl.tex.updatePDFtable(k, v, true)
172     end
173 end
174
175 -- with hyperref package
176 function YAMLvars.prc.PDFtitle(var, val)
177     tex.print('\@hypersetup{pdftitle={'.val..'}')
178 end
179
180 function YAMLvars.prc.PDFauthor(var, val)
181     tex.print('\@hypersetup{pdfauthor={'.val..'}')
182 end
183
184 -- --

```

