penlightplus

Additions to the Penlight Lua Libraries

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This package first loads the [import]penlight package.
The pl option may be passed to this package to create an alias for penlight.
globals option may be used to make several of the functions global (as discussed below).

texlua usage

If you want to use penlightplus.lua with the texlua interpreter (no document is made, but useful for testing your Lua code), you can access it by setting __SKIP_TEX__ = true before loading. For example:

```
package.path = package.path .. ';'..'path/to/texmf/tex/lualatex/penlightplus/?.lua'
package.path = package.path .. ';'..'path/to/texmf/tex/lualatex/penlight/?.lua'
penlight = require'penlight'

__SKIP_TEX__ = true  --only required if you want to use
                     --penlightplus without a LaTeX run
__PL_GLOBALS__ = true -- optional, include global definitions

require'penlightplus'
```

The following global Lua variables are defined:

__SKIP_TEX__ If using the penlightplus package with texlua (good for troubleshooting), set this global before loading penlight
The gloals flags below are taken care of in the package options:
__PL_GLOBALS__ If using package with texlua and you don't want to set some globals (described in next sections), set this global before to true loading penlight

`__PL_NO_HYPERREF__` a flag used to change the behaviour of a function, depending on if you don't use the hyperref package
`__PDFmetadata__` a table used to store PDF meta-data

penlight additions

Some functionality is added to penlight and Lua.

`pl.hasval(x)` Python-like boolean testing
`COMP'xyz'()` Python-like comprehensions:
`https://lunarmodules.github.io/Penlight/libraries/pl.comprehension.html`
`math.mod(n,d)`, `math.mod2(n)` math modulous
`string.totable(s)` string a table of characters
`string.delspace(s)` clear spaces from string
`pl.char(n)` return letter corresponding to 1=a, 2=b, etc.
`pl.Char(n)` return letter corresponding to 1=A, 2=B, etc.

`pl.utils.filterfiles(dir,filt,rec)` Get files from dir and apply glob-like filters. Set rec to `true` to include sub directories

A `pl.tex.` module is added

`add_bkt_cnt(n)`, `close_bkt_cnt(n)`, `reset_bkt_cnt` functions to keep track of adding curly brackets as strings. `add` will return `n` (default 1) {'s and increment a counter. `close` will return `n` }'s (default will close all brackets) and decrement.
`_NumBkts` internal integer for tracking the number of brackets
`opencmd(cs)` prints `\cs` { and adds to the bracket counters.

`xNoValue,xTrue,xFalse`: `xparse` equivalents for commands

`prt(x),prtn(x)` print without or with a newline at end. Tries to help with special characters or numbers printing.
`prtl(l),prtt(t)` print a literal string, or table
`wrt(x), wrtn(x)` write to log
`help_wrt(s1, s2)` pretty-print something to console. S2 is a flag to help you find., alias is `wrth`
`prt_array2d(tt)` pretty print a 2d array

`pkgwarn(pkg, msg1, msg2)` throw a package warning
`pkgerror(pkg, msg1, msg2, stop)` throw a package error. If stop is true, immediately ceases compile.

`defcmd(cs, val)` like `\gdef` , but note that no special chars allowed in `cs`(eg. `@`)

`defmacro(cs, val)` like `\gdef` , allows special characters, but any tokens in val must be predefined (this uses `token.set_macro` internally)

`newcmd(cs, val)` like `\newcommand`

`renewcmd(cs, val)` like `\renewcommand`

`prvcmd(cs, val)` like `\providecommand`

`deccmd(cs, dft, overwrite)` declare a command. If `dft` (default) is `nil`, `cs` is set to a package warning saying `'cs' was declared and used in document, but never set`. If `overwrite` is true, it will overwrite an existing command (using `defcmd`), otherwise, it will throw error like `newcmd`.

`get_ref_info(l)` accesses the `\r @label` and returns a table

global extras

If the package option `globals` is used, many additional globals are set for easier scripting. All `pl.tex` functions, and variables, `pl.hasval`, `pl.COMP`, `pl.utils.kpairs`, `pl.utils.npairs` become globals. `pl.tablex` is aliased as `TX` (which also includes all native Lua table functions), and `pl.array2d` is aliased as `A2d`.

Macro helpers

`\MakeluastringCommands [def]{spec}` will let `\plluastring (A|B|C..)` be `\luastring (N|O|T|F)` based on the letters that `spec` is set to (or `def` if nothing is provided) This is useful if you want to write a command with flexibility on argument expansion. The user can specify `n`, `o`, `t`, and `f` (case insensitve) if they want no, once, twice, or full expansion. For example, we can control the expansion of args 2 and 3 with arg 1:

```
\NewDocumentCommand{\splitToComma}{ O{nn} m m }{%
  \MakeluastringCommands[nn]{#1}%
  \luadirect{penlight.tex.split2comma(\plluastringA{#2},\plluastringB{#3})}%
}
```

Lua boolean expressions for LaTeX conditionals

`\ifluax {<Lua expr>}{<do if true>}[<do if false>]` and
`\ifluax {<Lua expr>}{<do if true>}[<do if false>]` for truthy (uses `penlight.hasval`)

```
\ifluax{3^3 == 27}{3*3*3 is 27}[WRONG]\\
\ifluax{abc123 == nil}{Var is nil}[WRONG]\\
\ifluax{not true}{tRuE}[fAlSe]\\
\ifluax{''}{TRUE}[FALSE]\\
\ifluaxv{''}{true}[false]\\
```

3*3*3 is 27
Var is nil
fAlSe
TRUE
false

Creating and using Lua tables in LaTeX

`penlightplus` provides a Lua-table interface. Tables are stored in the `penlight.tbls` table.

`\newtbl {t}` declares a new table with name `t`
`\chgtbl {t}` changes the 'recent' table
`\tblfrkv {t}{key-val string}[luakeys opts]` new table from key-vals using `luakeys`
`\tblfrcsv` a shorthand `\tblfrkv {t}{csv}[naked_as_value=true,opts]`, a good way to convert a comma-separated list to an array
`\settbl {i}{v}` sets a value of the table/index `i` to `v`
`\gettbl {i}` gets the value and `tex.sprint()`'s it
`\deftbl {i}{d}` pushes the value to a `cs` named `d`
`\gdeftbl {i}{d}` pushes the value to a global
`\iftbl {i}{tr}[fa]` runs code `ta` if the item is true else `fr`
`\iftblv {i}{tr}[fa]` runs code `ta` if the item is truthy else `fr`
`\kvtblundefcheck` will throw an error if you use define a table from key-values and use a key that was not specified in the luakeys parse options via `opts.defaults` or `opts.defs`.

There are 3 ways to use the index (placeholder `{i}` above). `t.key` where `t` is the table name and `key` is a string key, `t/int` where `int` is an integer index (ie. uses `t[int]`, note that negative indexes are allowered where -1 is the last element), or simply use `ind` without the table name, where the assumed table is the last one that was created or changed to, (passing a number will used as an integer index).

```
\tblfrkv{my}{a,b,c,first=john,last=smith}%
    [defaults={x=0,1=one,n=false,y=yes}]
\gettbl{my.a}\\
\gettbl{my.x}\\
\iftbl{n}{tr}[fa]\\
\iftblv{n}{TR}[FA]\\
\iftbl{my.y}{Tr}[Fa]\\
\iftblv{y}{tR}[fA]\\
%% \kvtblundefcheck % would throw error
\deftbl{my.first}{mydef} \mydef\\
{\deftbl{last}{mydef} \mydef} \mydef\\
{\gdeftbl{last}{mydef}} \mydef\\

\tblfrcsv{me}{a,b,"c,see",d,e}
\gettbl{me/1},\gettbl{2}\\
\gettbl{3}\\
\settbl{me/4}{D}\gettbl{me/4}\\
\settbl{5}{E}\gettbl{5}\\
\gettbl{-2},\gettbl{me/-1}\\
%% \gettbl{k} % would throw error
```

true
0
fa
FA
Tr
tR
john
smith john
smith

a,b
c,see
D
E
D,E

Splitting strings

Splitting text (or a cmd) into oxford comma format via: `\splitToComma [expansion level]{text}{text to split on}`:

```
-\splitToComma{  j doe  }{\and}-\\
-\splitToComma{  j doe \and s else  }{\and}-\\
-\splitToComma{  j doe \and s else \and a per }{\and}-\\
-\splitToComma{  j doe \and s else \and a per \and f guy
    }{\and}-

\def\authors{j doe \and s else \and a per \and f guy}
\splitToComma[o]{\authors}{\and}
```

-j doe-
-j doe and s else-
-j doe, s else, and a per-
-j doe, s else, a per, and f guy-
j doe, s else, a per, and f guy

The expansion level is up to two characters, `n|o|t|f`, to control the expansion of each argument.

You can do a similar string split but to `\item` instead of commas with `\splitToItems`

```
\begin{itemize}
  \splitToItems{kale\and john}{\and}
  \splitToItems{kale -john -someone else}{-}
  \splitToItems{1,2,3,4}{,}
\end{itemize}
```

- kale
- john
- kale
- john
- someone else
- 1
- 2
- 3
- 4