luarandom

Create a list of random numbers with or without multiple values; v. 0.01

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Contents

1 Random numbers

Package `luarandom` supports the creation of random number lists where a number will appear only once or multiple times. With LuaTEX all random numbers are build with the help of Lua which has the advantage that there will be no problem with TEX's limited parameter stack size. However, this package will *not* run with other TEX-engines than LuaLATEX.

2 The Macros

```
\makeSimpleRandomNumberList{Left}{Right}{N}% multiple values possible
\makeRandomNumberList{Left}{Right}{N} % no multiple values!
\getNumberFromList{number}
```

The list of the random numbers is saved in the Lua table `RandomNumbers`.

3 Examples

26, 18, 17, 3, 16, 29, 11, 16, 4, 13, 23, 4, 23, 27, 26, 28, 27, 10, 21, 27, 29, 6, 10, 3, 12, 25, 28, 7, 18, 16, 5, 11, 21, 26, 18, 13, 4, 14, 12, 30, 23, 20, 19, 7, 17, 24, 29, 27, 15, 22, 28, 3, 9, 10, 1, 2, 8, 6, 16, 25,

```
\small
\makeSimpleRandomNumberList{1}{30}{30}% with multiple values (hopefully ;-)
\multido{\iA=1+1}{30}{\getNumberFromList{\iA}, }

\makeRandomNumberList{1}{30}{30}% without multiple values
\multido{\iA=1+1}{30}{\getNumberFromList{\iA}, }
```

The following example uses PSTricks related packages which cannot be run directly with LuaLATEX. The package `auto-pst-pdf-lua` will convert the PSTricks stuff in the baclground into PDF images which will be included in a second run.

82	85	70	84	8	19	24	63	46	88
18	66	61	39	12	48	81	47	32	98
51	87	42	79	92	16	57	59	17	6
54	49	20	35	58	94	68	91	15	62
90	73	65	34	74	13	50	80	83	27
96	28	40	3	5	14	55	43	1	78
10	100	38	11	52	33	77	26	89	7
93	30	9	75	45	60	36	41	72	99
67	23	25	22	56	71	37	21	44	95
31	76	4	97	64	69	53	2	29	86

```
\newcounter{RandNo}\setcounter{RandNo}{1}
\def\n{10} \def\N{\the\numexpr\n*\n}
\makeRandomNumberList{1}{\N}{\N}
\begin{pspicture}(\n,\n)
  \psgrid[subgriddiv=0,gridlabels=0pt]
  \multido{\rRow=0.5+1.0}{\n}{\multido{\rCol=0.5+1.0}{\n}{%
     \rput(\rCol,\rRow){\textcolor{randomhsb}{\getNumberFromList{\theRandNo}}}%
    \stepcounter{RandNo}}}
\end{pspicture}
```

4 The code

```
% $Id: luarandom.sty 862 2018-12-15 16:25:55Z herbert $
%%
%% This is file ‘luarandom.sty’.
%%
%% IMPORTANT NOTICE:
%%
%% luarandom Copyright (C) 2019- Herbert Voss <hvoss@tug.org>
%%
%% This package may be distributed under the terms of the LaTeX Project
%% Public License, as described in lppl.txt in the base LaTeX distribution.
%% Either version 1.0 or, at your option, any later version.
%%

\NeedsTeXFormat{LaTeX2e}
\ProvidesPackage{luarandom}[2018/12/16 v 0.01 package for random numbers]
\RequirePackage{ifluatex}
\def\lua@nl{^^J\space\space\space\space}
\newcommand\lua@PackageError[2]{\PackageError{luarandom}{\lua@nl #1^^J}{#2}}
\ifluatex\else
    \lua@PackageError{%
      "You are not using LuaTeX\app@nl
```

```
      the lua definitions will not be available!}
     {If you run the source from a GUI then set
      the compiler "lualatex" in the
      preferences.}%
\fi

\RequirePackage{luacode}
\begin{luacode*}
RandomNumbers = {}

function allFound(R)
  local r1 = R[1]
  local i
  for i=2,#R do
    r1 = r1 and R[i]
    if not r1 then return false end
  end
  return true
end

function makeRandomNumberList(l,r,n)
  RandomNumbers = {}
  math.randomseed(os.time())
  local R = {}
  local i,j
  for i=1,n do R[i] = false end
  repeat
    local rand = math.random(l,r)
    if not R[rand] then
      R[rand] = true
      RandomNumbers[#RandomNumbers+1] = rand
    end
  until allFound(R)
end

function makeSimpleRandomNumberList(l,r,n)
  RandomNumbers = {}
  math.randomseed(os.time()/3)
  local i
  for i=1,n do RandomNumbers[#RandomNumbers+1] = math.random(l,r) end
end

function getRand(i)
 tex.print(RandomNumbers[i])
end
\end{luacode*}

\def\makeRandomNumberList#1#2#3{%
  \directlua{makeRandomNumberList(#1,#2,#3)}}
\def\makeSimpleRandomNumberList#1#2#3{%
  \directlua{makeSimpleRandomNumberList(#1,#2,#3)}}
\def\getNumberFromList#1{\directlua{getRand(#1)}}


\endinput
```

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