luarandom

Create a list of random numbers with or without multiple values; v. 0.02

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

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

3 Examples

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

```
\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}, }
```

With the optional argument [seed number], the seed function is not called with the current time, but with the optional value (integer).

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

```
\small
\makeSimpleRandomNumberList[999]{1}{30}{30}% with multiple values and value seed
\multido{\iA=1+1}{30}{\getNumberFromList{\iA}, }

\makeRandomNumberList[999]{1}{30}{30}% without multiple values and value seed
\multido{\iA=1+1}{30}{\getNumberFromList{\iA}, }

\makeSimpleRandomNumberList[999]{1}{30}{30}% with multiple values and value seed
\multido{\iA=1+1}{30}{\getNumberFromList{\iA}, }

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

12, 23, 4, 24, 2,

```
\makeRandomNumberList{2}{30}{5}%
\multido{\iA=1+1}{5}{\getNumberFromList{\iA}, }
```

The following example uses PSTricks related packages which can be run directly with LuaLaTeX.

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

```
\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 813 2023-11-13 19:33:29Z herbert $
%%
%% This is file `luarandom.sty'.
%%
%% IMPORTANT NOTICE:
%%
%% luarandom Copyright (C) 2023- 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 1.3 or, at your option, any later version.
%%

\NeedsTeXFormat{LaTeX2e}
\ProvidesPackage{luarandom}[2023/11/12 v 0.02 package for random numbers]
\RequirePackage{iftex}

\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,seed)
 RandomNumbers = {}
 if seed == 0 then
  math.randomseed(os.time())
 else
  math.randomseed(seed)
 end
 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+1-l] then
   R[rand+1-l] = true
   RandomNumbers[#RandomNumbers+1] = rand
  end
 until allFound(R)
end
```

```
function makeSimpleRandomNumberList(l,r,n,seed)
  RandomNumbers = {}
  if seed == 0 then
    math.randomseed(os.time()/3)
  else
    math.randomseed(seed)
  end
  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*}

\newcommand\makeRandomNumberList[4][0]{%
  \directlua{makeRandomNumberList(#2,#3,#4,#1)}}
\newcommand\makeSimpleRandomNumberList[4][0]{%
  \directlua{makeSimpleRandomNumberList(#2,#3,#4,#1)}}
\def\getNumberFromList#1{\directlua{getRand(#1)}}


\endinput
```

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