Package 'RSDK'

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Type Package

Title Sudoku with R

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Description This is a sudoku game package with a shiny application for playing .

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Contents

`atbox` *atbox()*

Description

This function checks if a value already exists in a 3 by 3 box from a sudoku grid

Usage

```
atbox(x, i, j, n)
```

Arguments

`x`	A sudoku grid
`i`	An index of a line from the box
`j`	An index of a column from the box
`n`	a value to check its existance in the box that contains the cell of the index (i,j)

Value

TRUE if the checked value is on the box or FALSE if the checked value is not on the box

Examples

```
atbox(x=grid_gen(49),1,4,8)
```

`atcol` *atcol()*

Description

This function checks if a value already exists in a column from a sudoku grid

Usage

```
atcol(x, j, n)
```

Arguments

x	A sudoku grid
j	An index of a column from the grid
n	a value to check its existance in the column j

Value

TRUE if the checked value is on the column or FALSE if the checked value is not on the column

Examples

```
atcol(x=grid_gen(63),1,8)
atcol(x=grid_gen(49),7,6)
```

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atrow *atrow()*

Description

This function checks if a value already exists in a row from a sudoku grid

Usage

```
atrow(x, i, n)
```

Arguments

x	A sudoku grid
i	An index of a row from the grid
n	a value to check its existance in the row i

Value

TRUE if the checked value is on the row or FALSE if the checked value is not on the row

Examples

```
atrow(x=grid_gen(63),1,8)
atrow(x=grid_gen(49),7,6)
```

`bt_solver` *bt_solver()*

Description

This function is a recurcive function that solves a sudoku grid using the backtracking algorithme

Usage

```
bt_solver(x)
```

Arguments

x	A sudoku grid

Value

A list of two elements in the first one there is the grid x solved as a matrix of 9 by 9, and the second one contains the number of backtracking does R do to solving it.

Examples

```
bt_solver(x=grid_gen(49))
```

`check_grid` *Check_grid()*

Description

This function checks if a 9 by 9 grid is a complete sudoku grid (each number appear only once in its row,column and box)

Usage

```
check_grid(x)
```

Arguments

x	A sudoku grid

Value

True if x is a cpmlete sudoku grid False if x is not

Examples

```
check_grid(x=grid_gen_cplt())
check_grid(x=grid_gen(54))
```

grid_gen *grid_gen()*

Description

This function generates a sudoku grid with a given number for the emty cells

Usage

```
grid_gen(t)
```

Arguments

t	The number of the emty cells

Value

A sudoku grid with t empty cells

Examples

```
Grid_45 = grid_gen(45)
```

grid_gen_cplt *grid_gen_cplt()*

Description

This function generates a complete sudoku grid randomly

Usage

```
grid_gen_cplt()
```

Value

A complete sudoku grid

Examples

```
Grid_complete = grid_gen_cplt()
```

grid_gen_lv *grid_gen_lv()*

Description

This function generates a sudoku grid for four levels of playing "Easy", "Difficult","Hard" and "Legend" based on the number of backtraking does the finction `bt_solver` did to solve the grid.

Usage

```
grid_gen_lv(lv)
```

Arguments

`lv`	A string argument level for the grid and must be "Easy", "Difficult","Hard" or "Legend"

Value

A sudoku grid associate to the level in `lv`

Examples

```
grid_gen_lv("Easy")
grid_gen_lv("Legend")
```

ispossible *ispossible()*

Description

This function checks if it is possible to put a given number in a given empty cell

Usage

```
ispossible(x, i, j, n)
```

Arguments

`x`	A sudoku grid
`i`	The index of the row of the given cell
`j`	The index of the column of the given cell
`n`	The number that we want to check if is possible to put it in the cell of the index (i,j)

Value

True if it is possible to put n in the cell (i,j)

Examples

```
ispossible(x=grid_gen_cplt(),4,5,6)
ispossible(x=grid_gen_cplt(),4,5,6)
```

---

nbrposs *nbrposs()*

Description

This function returns the number of possibilities for a given empty cell

Usage

```
nbrposs(x, i, j)
```

Arguments

x	A sudoku grid
i	The index of the row of the given cell
j	The index of the column of the given cell

Value

Number of possibilities for the cell (i,j)

Examples

```
nbrposs(x=grid_gen_cplt(),5,7)
nbrposs(x=grid_gen_cplt(),6,9)
```

order_wposs *order_wposs()*

Description

This function returns an ordred data frame by number of the possibilities for all the empty cells in the grid with index of row for the first column and index of column for the second column and the number of possibilities in third column

Usage

```
order_wposs(x)
```

Arguments

x	A sudoku grid

Value

data frame

Examples

```
order_wposs(x=grid_gen_cplt())
```

perm_mat *perm_mat()*

Description

This function permutes the columns of a given matrix with a cyclic permutaion

Usage

```
perm_mat(a, v)
```

Arguments

a	A matrix
v	The length of the cyclic permutation

Value

A matrix permuted cyclically by v columns

Examples

```
perm_mat(a=diag(1,5),4)
```

perm_vec *perm_vec()*

Description

This function permutes a given vector with a cyclic permutaion

Usage

```
perm_vec(x, i)
```

Arguments

x	A vector
i	The length of the cyclic permutation

Value

A vector permuted cyclically by x values

Examples

```
perm_vec(1:6,4)
perm_vec(27:50,15)
```

plt_grid *plt_grid()*

Description

This function plots a given sudoku grid

Usage

```
plt_grid(X)
```

Arguments

X	A sudoku grid

Value

a plot of the grid

Examples

```
plt_grid(X=grid_gen_cplt())
```

plt_grid_play *plt_grid_play()*

Description

This function gives a reactive plot of the grid for the shiny application

Usage

```
plt_grid_play(B, x)
```

Arguments

B	Initial grid
x	The grid that the user put the numbers on it

Value

a plot of the grid with the user input with a different color red if the input is on the wrong cell and green if the input is on the right cell

poss *poss()*

Description

This function returns a vector of possibilities for a given empty cell

Usage

```
poss(x, i, j)
```

Arguments

x	A sudoku grid
i	The index of the row of the given cell
j	The index of the column of the given cell

Value

Vector of possibilities for the cell (i,j)

Examples

```
poss(x=grid_gen(46),4,7)
poss(x=grid_gen(49),3,9)
```

runSudoku *runSudoku()*

Description

runSudoku()

Usage

```
runSudoku()
```

Value

Opens the sudoku shiny application

solver *solver()*

Description

This function is a recurcive function that solves a given sudoku grid for shiny application and it is more optimized than the backtraking solver on the function `bt_solver`

Usage

```
solver(x)
```

Arguments

x	A sudoku grid

Value

The grid x solved

Examples

```
solver(x=grid_gen(46))
```

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