

# R Class and Package for Generating Crosswords

R Meetup Hamburg

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# Usage

```
library(crossword)
```

```
cw <-
```

```
  Crossword$new(rows = 4, columns = 4)
```

## Usage

```
cw$add_words(  
  c("back", "nasa", "kick", "nuk", "ic", "sic")  
)
```

```
## #BACK# / 5 / 1 / right /  
##  
## #NASA# / 1 / 3 / down /  
##  
## #KICK# / 1 / 5 / down /  
##  
## #NUK# / 2 / 2 / right /  
##  
## #IC# / 3 / 4 / down /  
##  
## #SIC# / 4 / 2 / right /
```

# Usage

CW

```
## . 1 2 3 4 5 6
## 1 # # # # #
## 2 # # N U K #
## 3 # . A # I #
## 4 # # S I C #
## 5 # B A C K #
## 6 # # # # #
```

# Data

```
cw$letters
```

##		[,1]	[,2]	[,3]	[,4]	[,5]	[,6]
##	[1,]	"#"	"#"	"#"	"#"	"#"	"#"
##	[2,]	"#"	"#"	"N"	"U"	"K"	"#"
##	[3,]	"#"	". "	"A"	"#"	"I"	"#"
##	[4,]	"#"	"#"	"S"	"I"	"C"	"#"
##	[5,]	"#"	"B"	"A"	"C"	"K"	"#"
##	[6,]	"#"	"#"	"#"	"#"	"#"	"#"

# Data

```
cw$words
```

```
## # A tibble: 6 x 6
```

##	row	col	length	direction	clue	word
##	<int>	<int>	<int>	<chr>	<chr>	<chr>
## 1	5	1	4	right		BACK
## 2	1	3	4	down		NASA
## 3	1	5	4	down		KICK
## 4	2	2	3	right		NUK
## 5	3	4	2	down		IC
## 6	4	2	3	right		SIC

# Technicalities

- ▶ OOP:
  - ▶ not a fan of OOP ... but!
  - ▶ multiple pieces of data that only make sense together
  - ▶ easier to iterate on data and functions at the same time
  - ▶ state is important - adding words depends on the grid state
  - ▶ R6 (easy to use classes for traditional OOP)

# Technicalities

- ▶ data fields:
  - ▶ rows (integer)
  - ▶ columns (integer)
  - ▶ letters (matrix)
  - ▶ words (data.frame)
  - ▶ [restrictions\_right, restrictions\_down (data.frame)]



# Technicalities

- ▶ methods:

- ▶ `initialize()` (row, columns)
- ▶ `add_words()` (words, clues)
- ▶ `density()`
- ▶ [`put_word_on_grid()`, `add_words()`, `update_grid_data()`, `print()`]

# Algorithm?

- ▶ quite dumb
- ▶ loop over words
- ▶ data on cells:
  - ▶ space (right/down)
  - ▶ letters already placed
- ▶ adding word
  - ▶ which cells have enough space
  - ▶ which cell's regex match the word
- ▶ placing based on weighting of cells
  - ▶ balance right and down
  - ▶ try to put in the center of grid
  - ▶ try to cross as many letters on grid as possible

# End

- ▶ Peter Meissner

- ▶ `twitter <- "marvin_dpr"`
  - ▶ `homepage <- "pmeissner.com"`
  - ▶ `Github <- "petermeissner"`

- ▶ crossword

- ▶ `status <- "work in progress"`
  - ▶ `url <-`  
`"https://github.com/petermeissner/crossword"`