



# R Class and Package for Generating Crosswords

R Meetup Hamburg

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01 July 2017

# 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"`