R Class and Package for Generating Crosswords

R Meetup Hamburg

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Usage

```r
library(crossword)
cw <- Crossword$new(rows = 4, columns = 4)
cw$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"