Knitting Clojure snippets

GenerateMe

2020-05-17

# Generating documents with knitr and Clojure

This document is rendered by R knitr package with embedded Clojure code. Yes, it’s possible. The renderer is configured to use nRepl client: [rep](https://github.com/eraserhd/rep).

## What is knitr in short

Knitr is R package which generates really variety documents out of markdown file with embedded code.

## Let’s run something

First let’s define data.

(def data {:a [1 2 3]  
 :b [3 4 5]})  
data

#'user/data  
{:a [1 2 3], :b [3 4 5]}

Code was executed, data is defined and we can run another chunk.

(keys data)

(:a :b)

And another one (everything is kept in user namespace).

(->> data  
 vals  
 (apply concat)  
 (reduce +))

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## Pretty print

(clojure.pprint/pprint (repeatedly 6 #(repeatedly 3 rand)))

((0.6565240347021365 0.6537473309756925 0.5216689531898406)  
 (0.5938700235064084 0.1858116105580747 0.6573425547881518)  
 (0.44166468225994127 0.13412830009611731 0.10030814040559477)  
 (0.2535683339663847 0.3652034332340117 0.1883214565864535)  
 (0.19719593866627627 0.635156740745418 0.3356971887272886)  
 (0.2089823835216048 0.43854485882740357 0.7071467360238737))

## Generate image

(require '[clojure2d.core :refer [save]]  
 '[clojure2d.color :as c]  
 '[clojure2d.extra.utils :as u])

(-> :cubehelix  
 (c/gradient)  
 (u/gradient->image true)  
 (save "gradient.png"))



Generated gradient with luma

## Generate markdown

(println "  
test/data/stocks.csv [5 3]:  
  
| symbol | date | price |  
|--------+------------+-------|  
| MSFT | 2000-01-01 | 39.81 |  
| MSFT | 2000-02-01 | 36.35 |  
| MSFT | 2000-03-01 | 43.22 |  
| MSFT | 2000-04-01 | 28.37 |  
| MSFT | 2000-05-01 | 25.45 |  
")

test/data/stocks.csv [5 3]:

|  |  |  |
| --- | --- | --- |
| symbol | date | price |
| MSFT | 2000-01-01 | 39.81 |
| MSFT | 2000-02-01 | 36.35 |
| MSFT | 2000-03-01 | 43.22 |
| MSFT | 2000-04-01 | 28.37 |
| MSFT | 2000-05-01 | 25.45 |

## How to setup

I’m using Emacs with CIDER here.

* Clojure
  + Download and install [rep](https://github.com/eraserhd/rep)
  + Be able to run nRepl
* R
  + Install R with knitr and rmarkdown packages (and all needed deps, like pandoc)
* Emacs
  + Install ESS, poly-R package which enables REPL inside Markdown file.

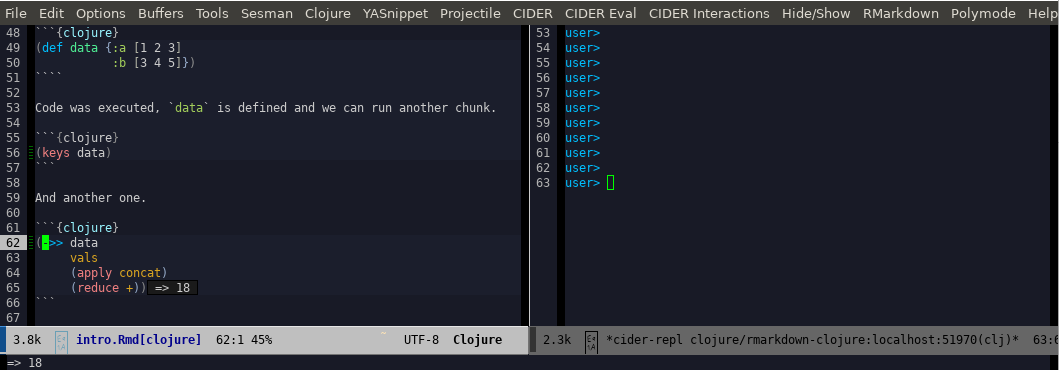
Run nRepl, create .Rmd file and add below chunk at the beginning of it. As you can see, there is a place to define nrepl\_port. Find your port and change this value. I haven’t been able to find an easy way to setup it automatically (yet).

```{r setup, include=FALSE}  
find\_nrepl\_port\_up <- function() {  
 wd <- getwd()  
 while(wd != dirname(wd)) {  
 f <- paste0(wd,"/.nrepl-port")  
 if(file.exists(f)) return(paste0("@",f))  
 wd <- dirname(wd)  
 f <- NULL  
 }  
}  
port\_file <- find\_nrepl\_port\_up()  
if(is.null(port\_file)) stop("nREPL port not found")  
library(knitr)  
knitr\_one\_string <- knitr:::one\_string  
nrepl\_cmd <- "rep"  
opts\_chunk$set(comment=NA, highlight=TRUE)  
knit\_engines$set(clojure = function(options) {  
 rep\_params <- if((options$results == "asis") || isTRUE(options$stdout\_only)) {  
 "--print 'out,1,%{out}' --print 'value,1,' -p"  
 } else {  
 "-p"  
 }  
 code <- paste(rep\_params, port\_file, shQuote(knitr\_one\_string(options$code)))  
 out <- if (options$eval) {  
 if (options$message) message('running: ', nrepl\_cmd, ' ', code)  
 tryCatch(  
 system2(nrepl\_cmd, code, stdout = TRUE, stderr = TRUE, env = options$engine.env),  
 error = function(e) {  
 if (!options$error) stop(e)  
 paste('Error in running command', nrepl\_cmd)  
 }  
 )  
 } else ''  
 if (!options$error && !is.null(attr(out, 'status'))) stop(knitr\_one\_string(out))  
 engine\_output(options, options$code, out)})  
```

When it’s done you can generate documents (html, pdf, whatever) within ESS or from external R session.

library(rmarkdown)  
render("README.Rmd","all")

## Emacs view



Emacs in action

## Rendered documents

* [HTML](https://genmeblog.github.io/rmarkdown-clojure/README.html)
* [PDF](https://github.com/genmeblog/rmarkdown-clojure/blob/master/README.pdf)
* [WORD](https://github.com/genmeblog/rmarkdown-clojure/blob/master/README.docx)

## What’s odd

There are couple of problems:

* manual renderer setup
* no pretty printing results by default

## RMarkdown references

* <https://bookdown.org/yihui/rmarkdown/>
* <https://bookdown.org/yihui/rmarkdown-cookbook/>