Using RMarkdown for reproducible and neat documents

Your name here
Your affiliation here

Contents

Date: !r Sys.Date()
R version: !r getRversion()
*Corresponding author: Your email here

Overview

This document showcases how to create and use `RMarkdown` documents.

You can easily create headings. This is a first order heading.

Then move down in heading order size

Like this subheading

And this fourth order heading

You can write in **bold** and *italicised* text (in **two** different *ways*).

You can write in-line `code` if you want to differentiate between when you are typing normally or highlighting `model parameters`, for example.

Equations like this $t' = \gamma(t - vx/c^2)$, to appear within text lines.

Create links to your website.

Make footnotes[1].

Insert line breaks between text like this, which works best in large slabs of text

Insert a horizontal line break using five asterisks ('*****')

The raw Rmd file also has the code for inserting user comments.

(There is also a page break here. Best seen in PDF. Check the raw Rmd file to see the code)

[1] Here is the footnote you created earlier, automatically formatted

Define equations

Accordingly, we write the eigenfunction of a spinless particle as the superposition of plane wave states of momentum (π) and energy (E_j) having amplitudes $a(\pi, E_j)$ (from [1]).

$$\phi n(r,t) = \sum_{i,j} a(p_i, E_j) e^{\frac{i}{h}(p_i \cdot r - E_j t)}$$

Create, alter, and embed plots

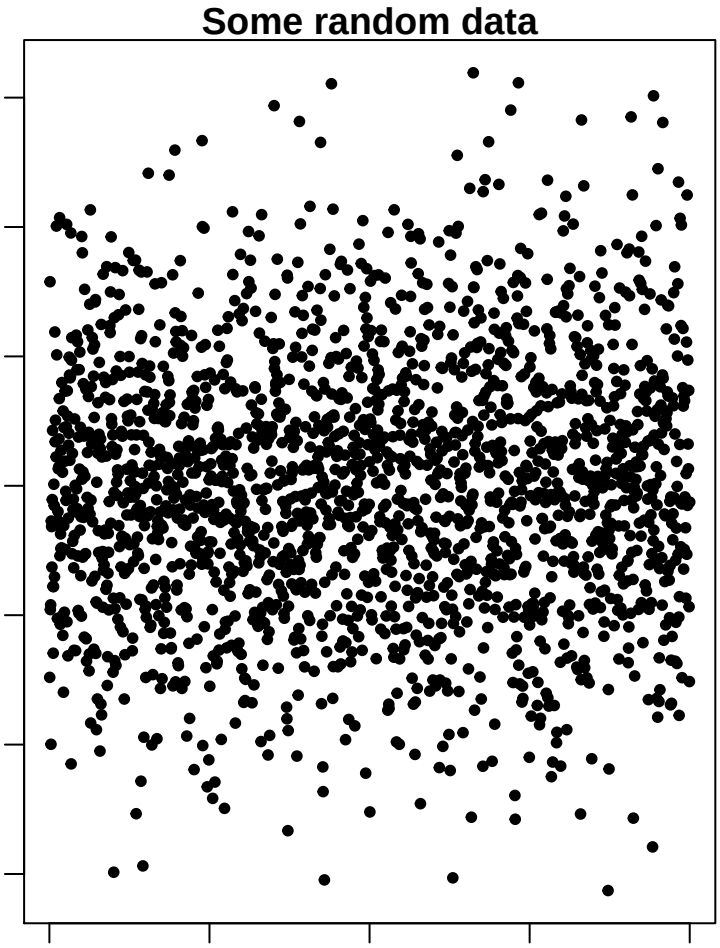


Figure 1. Example of a stock plot embedded into a PDF from RMarkdown.

Show plots with associated code

```
suppressWarnings(require(viridis))
bm <- 1
par(las=1,bty="n"); xlim <- c(-5,5);ylim <- c(0,0.5)
set.seed(12)
N <- 2000
rr <- rnorm(N); rr2 <- rnorm(N^2); rr3 <- rnorm(N+0.3)
rrd <- density(rr);rrd2 <- density(rr2);rrd3 <- density(rr3)
main <- paste0(N," points but plot better");xlab <- "Points in space"
if(bm==1){
  layout(matrix(c(rep(1,3),2:4), 2, 3, byrow = TRUE));sc <- 1
  plot(rr,las=1,bty="n",col=adjustcolor(viridis(N),0.5),pch=20,cex=runif(10,1,5),
       main=main,xlab=xlab)
for(r in list(rrd,rrd2,rrd3)){
  plot(r,xlim=xlim,ylim=ylim,main="")
  polygon(r,col=adjustcolor(viridis(250)[sc],0.5),border=viridis(250)[sc]);sc <- sc+100}
}else{par(mfrow=c(1,1))
  plot(rr,las=1,bty="n",col=adjustcolor(viridis(N),0.5),pch=20,cex=runif(10,1,5),
       main=main,xlab=xlab)}
```

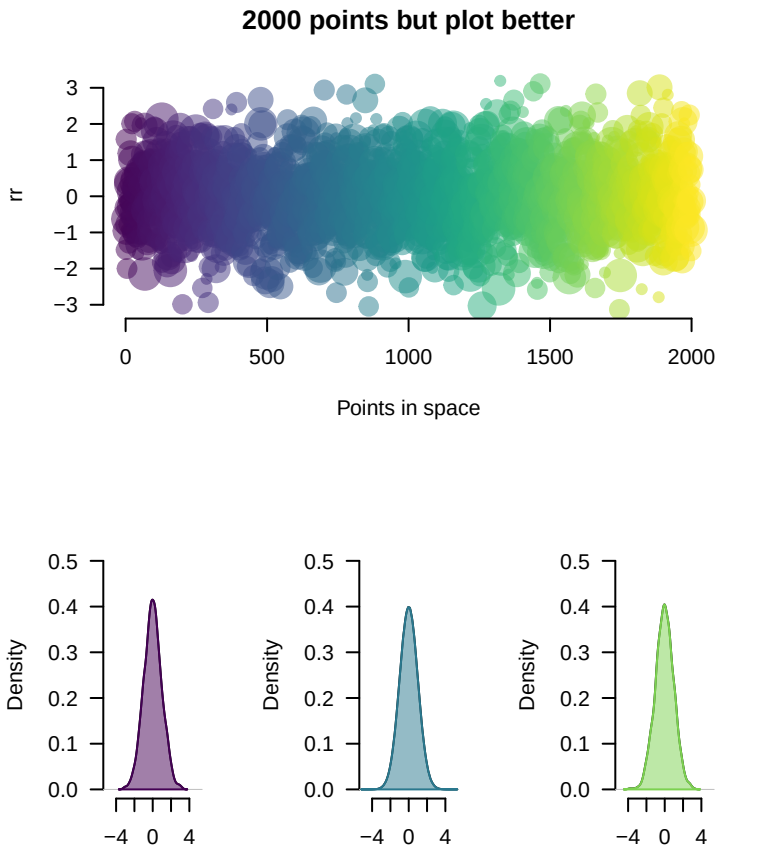


Figure 2. Example of a plot with improved graphics and its associated code embedded into the output document from RMarkdown.

And tables

Table 1. Definitions of model parameters for individual hosts and **parasites**. Dimensions and units: -, dimensionless; cm, centimetres; J, Joules; L, length.

Parameter	Definition	Dimension(unit)
L	structural length	cm
ee	scaled reserve density	J (cm^3)
D	host development	—
RH	energy in reproduction buffer	J

Use buttons or tabs for sub-chapters

Chapter 1

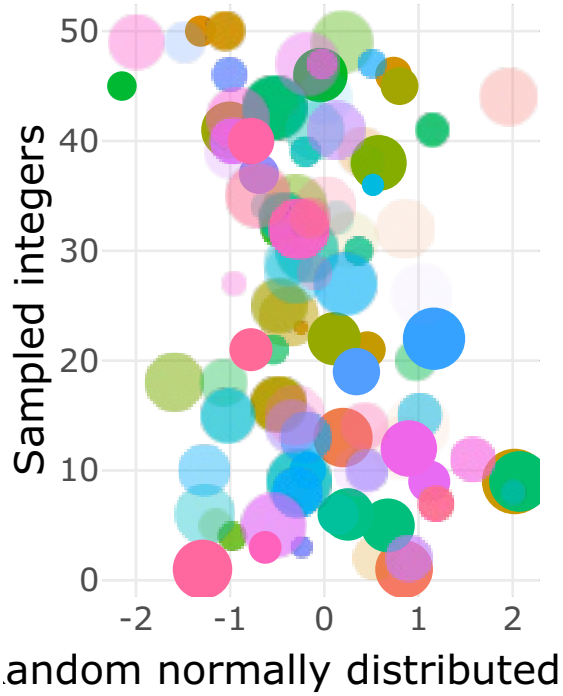
. . . . .

Then you can add whatever you want here like you would normally write in the `Rmd` file.

. . . . .

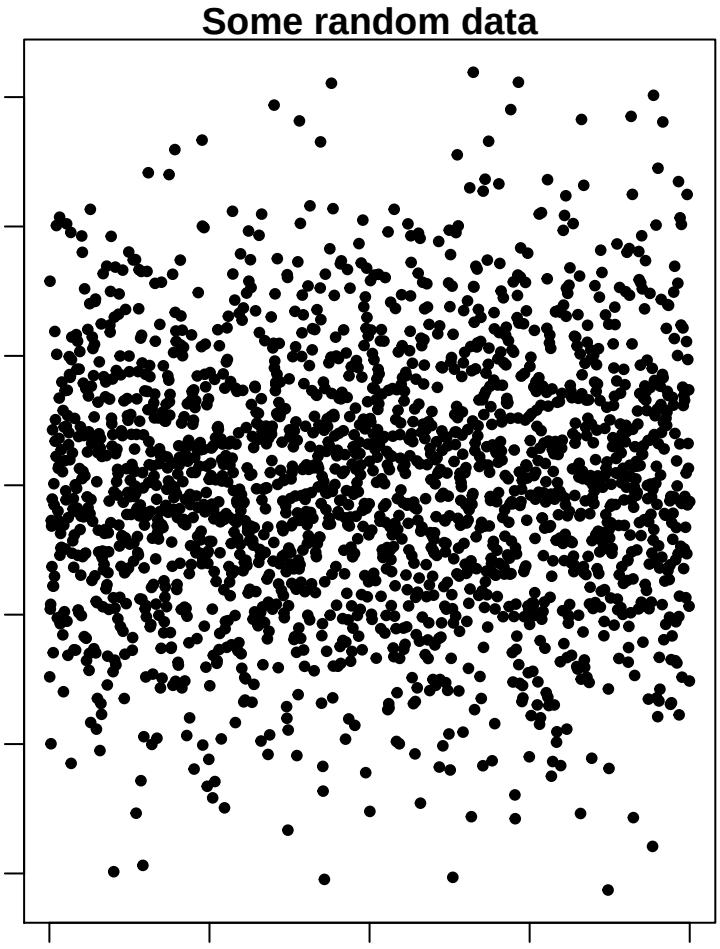
Chapter 2 (with new code)

Here's an Easter egg for you . . .



More tables

Here's a new way of creating tables using the `DT` package



Embed code from different languages

This is R code

```
pck <- 0
if(pck==1){
  p<-c("rJava", "RNetLogo"); remove.packages(p)
  # then install rJava and RNetLogo from source
  install.packages("rJava", repos = "https://cran.r-project.org/")
  install.packages("RNetLogo", repos = "https://cran.r-project.org/")
}
```

shell/bash

```
echo "Hello Bash!"
pwd # check working dir
git init # initialise git
```

Octave (and MATLAB from the `RMatlab` package).

`RMatlab` documentation.

```
b = [4; 9; 2] # Column vector
A = [ 3 4 5;
      1 3 1;
      3 5 9 ]
x = A \ b     # Solve the system Ax = b
```

HTML

```
<!-- links-->
        <div class="footer">
            <a href="dd_feed.html"
            class="transition fade_in">
                Latest post
            </a>
                 
            <a href="dd_contact.html"
            class="transition fade_in">
                Contact
            </a>
                 
            <a href="dd_subscribe.html"
            class="transition fade_in">
                Subscribe
            </a>
        </div>
```

CSS

```
# custom code for the tabs in this file
.btn {
    border-width: 0 0px 0px 0px;
    font-weight: normal;
    text-transform: ;
}
.btn-default {
    color: #f08080;
    background-color: #ffffff;
    border-color: #ffffff;
}
```

Javascript to access `html` and `css`

```
$('.title').css('color', 'red')
```

Python

```
x = 'hello, python world!'
print(x.split(' '))
```

Here's a complete list of available languages

```
names(knitr::knit_engines$get())
```

```
##  [1] "awk"       "bash"      "coffee"    "gawk"      "groovy"    "haskell"   "lein"
##  [9] "node"      "octave"    "perl"      "psql"      "Rscript"   "ruby"      "sas"
## [17] "sed"       "sh"        "stata"     "zsh"       "highlight" "Rcpp"      "tikz"
## [25] "c"         "fortran"   "fortran95" "asy"       "cat"       "asis"      "stan"
## [33] "block2"    "js"        "css"       "sql"       "go"        "python"    "julia"
## [41] "scss"
```

References

[1] Efthimiades, S., Physical meaning and derivation of Schrodinger and Dirac equations, Department of Natural Sciences, Fordham University, doi: d34464566.