

Efficient writing by choosing and personalizing open-source tools

February 3, 2022

John Nash
for
Virtual Meeting of Linux-Ottawa

Why?

- ***IF*** you write (most of us do!)
 - Want to focus on ***content***, not formatting
 - But formatting should be easy ***for the type of document that is the target***
 - Allow changes to be monitored
 - Secure the source material and output
- This presentation uses my ***personal*** choices
 - Likely NOT everybody's approach
 - Roll your own, taking away some of the ideas

Origins of choices

In prehistoric times (~1980 North Star Horizon)

- Few choices beyond rather simple text editors
 - SEE (De Smet C editor)
 - Formatter using text markup. Anderson Word Processor ...
1979 onwards
 - Evolved to Nash Page Lister. Basic then Pascal,
 - Paid Woody Suwalski for rights to use WED/NED editor which fed NPL
 - Used for typesetting Nash & Walker-Smith book on Nonlinear Parameter Estimation that was published in 1987

More traditional word processors

- Wordstar under CP/M – 1980s (I never used it)
- Word Perfect (actually from 1970s, but gained prominence from late 1980s)
 - Used in 1997-1999 for typesetting Nash and Nash, *Practical Forecasting for Managers* (WP 8)
 - Can use LibreOffice to load 300 page file – only 1 graphic seems to be distorted.
 - Details can be messy
 - Corel dropped the ball!

Word Processors since Y2K

- *Word* has dominated
- *WordPerfect* has declined
- *Star Office* --> *LibreOffice*
 - Main choice for Linux
 - Generally capable. *Word* seems more capable for generating documents with special features, but LO can read and edit them.
- *Abiword* offers a lighter-weight option for simple documents
- *Word Pro* (IBM) seems to be in decline
- *Google Docs* – web offering

Meanwhile – markup processing

- *Troff* – and similar tools from 1970s
 - DocBook and others
- $T_E X$ – Knuth in late 1970s.
 - Lamport's $LAT_E X$ made it more usable
 - Adopted as standard for leading math / stat journals

I Avoid Word Processors!

- I work in multiple languages and with math and science topics
 - Spell and grammar checkers are annoying!
- Images NEVER stay put where you want them

2010 – a defining issue



Choice to use LaTeX

- Every word processor I tried (Word, WP, WordPro, AbiWord, Star Office, LibreOffice, ...) failed to allow this triple picture to be laid out reasonably at the time of writing in 2010
- LaTeX worked, and I was using it for journal articles
 - VERY heavy learning curve. NOT RECOMMENDED FOR STARTERS
 - If you work at it, you can do anything!

Follow on (creative) writing

- Biography “worked” well (to pdf)
- Later wrote a novel to try to fill in blanks
 - Simplify the LaTeX preamble (front matter) and structure
 - Use an integrated editor/viewer/processor. I use *Texmaker*, but *Texworks* and *Texstudio* are similar
 - Macros/commands to simplify some common entries
 - `\dialog`
 - Some special characters

Is this LaTeX?

- Now leaves most of the formatting “hidden”
- Produces decent PDF
- Some work to get epub. I use *pandoc*, but there are glitches from time to time.
 - Use *Sigil* to tweak the epub. 202201: £ symbol in epub!!!
- UNSUITABLE for scientific work (too much work), but Nash 2014 book written 2012-2014 used it.
- I’ve combined with Subversion repo on private server to have backup and tracking

Markup since Y2K

- 2002: AsciiDoc
- 2004: Markdown ==> Rstudio::Rmarkdown
 - Rstudio (2011 J J Allaire) --> Sweave (TeX); later Rmarkdown/knitr
 - Extremely capable document production
 - Allows program code to be included, executed, and output included
 - Removes much of the bother of $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$, but the .tex file is available for tweaking. HTML, PDF or Word output. Also static web sites.
 - I use this for most “documents” except creative writing, including software documents for my own use.
 - Possibly Bookdown would work for creative works. NOT investigated.
 - Good support for GIT and SVN

My authoring ecosystem

- Texmaker / svn / pandoc (? sigil) for creative writing based on a standardized templates for “novels” and “collections”
- Rstudio / Rmarkdown for software documentation and scientific articles – mostly to PDF
 - Sometimes tweak the .tex file
- Libreoffice to edit work by other people from Word or Google Docs, or occasionally for special cases
 - Editing Gramps descendant tree output to .odt file

Recommendations

- Choices need to fit a large chunk of work
- Choices need to fit what you already are familiar with using and with work practices
- Worth watching for special tools that **could** be helpful. *Scrivener* is popular among some creative writers.
- I tend to use web to check spellings (but *Texmaker* does have a checker). Others may want spelling and grammar checkers.

Texmaker example

- Base framework – *Storied Futures*
- Open single story child document
- Rename and Save_As
- Put an `\input{child.tex}`
- Start writing
- F1 to get PDF

```

1 %% file: StoriedFuture.tex
2 \documentclass[14pt,letterpaper]{extbook}
3 \usepackage[margin=1.5in]{geometry}
4 \usepackage{makeidx} \usepackage{graphicx} \setlength{\textheight}{590pt}
5 \setlength{\textwidth}{390pt}
6 \usepackage{utf8}{inputenc}
7 \usepackage[T1]{fontenc}
8 \usepackage{lmodern}
9 \usepackage{fancyhdr}
10 \usepackage{lastpage}
11 \usepackage{placeins}
12 \usepackage{float} \usepackage{caption}
13 \usepackage{wrapfig}
14 \usepackage{subfigure}
15 \usepackage{units}
16 \usepackage{url}
17 \usepackage{subfig}
18 \usepackage{sidecap}
19 \usepackage{titlesec}
20 \setcounter{secnumdepth}{0}
21 \titleformat{\chapter}[display] {\fontfamily{ptm}\large\bfseries\centering}
  {\chaptertitlename \thechapter}{5pt}{\large}\titlespacing*{\chapter}{0pt}{30pt}{20pt}
22 \raggedbottom
23 \newcommand{\C}[1]{\tt \small \begin{quotation} {#1} \end{quotation} \rm \normalsize}}
24 \newcommand{\B}[1]{\bf #1 \rm}}
25 \newcommand{\I}[1]{\it #1 \rm}}
26 \newcommand{\V}[0]{\vspace{5mm}}
27 \newcommand{\bi}[1]{\textbf{ \textit{ #1}}}
28 \pagestyle{plain}
29
30 \newcommand{\dialog}[1]{`#1'} %% 160420 from Eileen
31
32
33
34 \begin{document}
35
36 \begin{center}

```

A Storied Future

John C. Nash

Copyright ©2021 and later by John C. Nash

nashjc @ ncf.ca
 18 Spyglass Ridge
 Ottawa, ON K2S 1R6
 Canada

A Storied Future is an ongoing collection of works of fiction and semi-fictitious memoirs. They are a subset of the author's short works that concern economic and technical themes, and

File	Type	Line	Message
00StoriedFuture.tex	Warning	line 119	Rerun to get the references right
00StoriedFuture.tex	Warning	line 1	Label(s) may have changed. Rerun to get cross-references right.

LOG FILE:
 This is pdfTeX, Version 3.14159265-2.6-1.40.20 (TeX Live 2019/Debian) (preloaded format=pdflatex 2021.12.27) 25 JAN 2022 19:19
 entering extended mode
 restricted \write18 enabled.
 %& line parsing enabled


```

1 \chapter*{Patcher}
2
3 I'm a Patcher. As a job, it's started to get a certain cachet
4 of approval like firefighters or emergency doctors. Can't say that was
5 what got me into it. I hadn't done great at school. My grades one and two
6 were in the middle of the Covid-19 pandemic, and I missed out on a lot and
7 never quite made it up. But I turned out to be good with my hands and could
8 fix things. When I got out of high school, the desalination projects to
9 provide agricultural water were just getting going. Canada was in a mess -- there were pitched battles between the
10 and some of the farmers who still were pumping the aquifers to
11 deaths.
12
13 Then that big industrialist Jacob Mallory points out that
14 a huge mess of waste plastic
15 in landfills, supposedly temporary depots for recycled
16 containers, and the Pacific gyre. With some robotics and
17 the people he funds found a way to make cheap pipes 50
18 And another group he invests in got some ideas from solar
19 systems to pump seawater into pressure towers for reverse
20 these mostly out of rubbish materials too, rather than
21
22 So now we have hundreds of small reverse osmosis plants
23 water they produce is desalinated enough to use for agriculture
24 the crops are chosen to be salt-resistant, or they use
25 that can be removed and processed somehow. The pipes are
26 standardized 50 cm. jobbies.
27
28 Apparently pipelines were a big no-no when I was a kid
29 When they broke, there was a nasty mess that poisoned
30 But slightly salty water isn't nearly so much of a problem
31 cheap plastic. Teams of us patchers go out and fix them.
32
33 A big break will require us to shut down a section and replace a few lengths
34 of pipe. Usually there are two or three pipes, so no big hassle for the farmers.
35 But usually there's just a small hole where the cheap recycled plastic was weak.
36 We have a big tool on the back of a small truck that we press over the hole and
37 pressurize with air. Then a laser melts some plastic cord over the hole and
38

```

Save As

Look in: /versioned/novels/StoriedFuture

Name	Size	Type	Date Modified
background		Folder	2021-12...45 P.M.
00StoriedFuture.tex	2.69 KiB	tex File	2022-01...19 P.M.
Patcher.tex	3.12 KiB	tex File	2021-12...45 P.M.
Stowaway.tex	8.18 KiB	tex File	2021-12...45 P.M.
Tribalism.tex	6.41 KiB	tex File	2021-12...45 P.M.

File name: nuciform.tex

Files of type: TeX files (*.tex *.bib *.sty *.cls *.mp *.Rnw *.asy)

Save Cancel

Storied Future

John C. Nash

and later by John C. Nash

18 Spyglass Ridge
Ottawa, ON K2S 1R6
Canada

A Storied Future is an ongoing collection of works of fiction and semi-fictitious memoirs. They are a subset of the author's

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function Addins

LinuxOttawaX.Rmd

Knit

```

20
21 You will likely be prompted to install some other software tools e.g., knitr.
22
23 # Enter a document
24
25 Open Rstudio and
26
27 File / New File / R Markdown
28
29 Give file a name and save after choosing author and output type.
30
31 Note that various "chunks" of code can be included.
32
33 ```{r chunk1}
34 sessionInfo() # tells what our R infrastructure is
35 myrn <- rnorm(2500, mean=10, sd=1.5)
36 hist(myrn)
37 ```
38
39 Knit the document (button on screen), or Ctrl-Shift-K.
40
41
41:1 # Enter a document

```

R Markdown

Environment History Connections Git Tutorial

Diff Commit

Staged Status Path

Staged	Status	Path
<input type="checkbox"/>	??	LinuxOttawaX.Rmd
<input type="checkbox"/>	??	LinuxOttawaX.pdf

Files Plots Packages Help Viewer

R: The Normal Distribution Find in Topic Refresh Help Topic

Normal {stats}

R Documentation

The Normal Distribution

Description

Density, distribution function, quantile function and random generation for the normal distribution with mean equal to mean and standard deviation equal to sd.

Usage

```

dnorm(x, mean = 0, sd = 1, log = FALSE)
pnorm(q, mean = 0, sd = 1, lower.tail = TRUE, log.p = FALSE)
qnorm(p, mean = 0, sd = 1, lower.tail = TRUE, log.p = FALSE)
rnorm(n, mean = 0, sd = 1)

```

Arguments

Console Terminal R Markdown Jobs

.../RNonlinearLS/LinuxOttawaX.Rmd

```

ink_bare_uris+tex_math_single_backslash --output LinuxOttawaX.tex --lua-filter /home/john/R/x86_64-pc-lin
ux-gnu-library/4.1/rmarkdown/rmarkdown/lua/pagebreak.lua --lua-filter /home/john/R/x86_64-pc-linux-gnu-li
brary/4.1/rmarkdown/rmarkdown/lua/latex-div.lua --self-contained --highlight-style tango --pdf-engine pdf
latex --variable graphics --variable 'geometry:margin=1in'
output file: LinuxOttawaX.knit.md

Output created: LinuxOttawaX.pdf

```

Rstudio -- Rmarkdown

- Open Rstudio. New Rmarkdown file
- Start entry
- Knit document
- Git/Subversion
- Special features – code, graphics, bibliography

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function Addins

RNonlinearLS

Console Terminal x Jobs x

R 4.1.2 · ~/current/GSoC2021/RNonlinearLS/

R version 4.1.2 (2021-11-01) -- "Bird Hippie"
 Copyright (C) 2021 The R Foundation for Statistical Computing
 Platform: x86_64-pc-linux-gnu (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
 You are welcome to redistribute it under certain conditions.
 Type 'license()' or 'licence()' for distribution details.

Natural language support but running in an English locale

R is a collaborative project with many contributors.
 Type 'contributors()' for more information and
 'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
 'help.start()' for an HTML browser interface to help.
 Type 'q()' to quit R.

> |

Environment History Connections Git Tutorial

Diff Commit

Staged Status Path

Files Plots Packages Help Viewer

New Folder Delete Rename More

Home > current > GSoC2021 > RNonlinearLS > VarietyInNLS

	Name	Size	Modified
	..		
<input type="checkbox"/>	HobbsTiming.R	873 B	Jan 21, 2022, 8:25 PM
<input type="checkbox"/>	sstimer.R	764 B	Jan 21, 2022, 8:25 PM
<input type="checkbox"/>	VarietyInNonlinearLeastSquaresCod...	408.4 KB	Jan 21, 2022, 8:25 PM
<input type="checkbox"/>	VarietyInNonlinearLeastSquaresCod...	55.2 KB	Jan 21, 2022, 8:25 PM

RNonlinearLS - main - R...

EN Tue 25 Jan, 20:21

```
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> |
```

New R Markdown

- Document
- Presentation
- Shiny
- From Template

Title:

Author:

Default Output Format:

- HTML
Recommended format for authoring (you can switch to PDF or Word output anytime).
- PDF
PDF output requires TeX (MiKTeX on Windows, MacTeX 2013+ on OS X, TeX Live 2013+ on Linux).
- Word
Previewing Word documents requires an installation of MS Word (or Libre/Open Office on Linux).

Create Empty Document OK Cancel

	Size	Modified
	873 B	Jan 21, 2022, 8:25 PM
	764 B	Jan 21, 2022, 8:25 PM
astSquaresCod...	408.4 KB	Jan 21, 2022, 8:25 PM
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Console Terminal Jobs

R 4.1.2 · ~/current/GSoC2021/RNonlinearLS/

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Environment History Connections Git Tutorial

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New R Markdown

- Document
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Title: LinuxOttawaX

Author: John C Nash

Default Output Format:

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PDF output requires TeX (MiKTeX on Windows, MacTeX 2013+ on OS X, TeX Live 2013+ on Linux).

Word

Previewing Word documents requires an installation of MS Word (or Libre/Open Office on Linux).

Create Empty Document

OK

Cancel

Help Viewer

Rename More

2021 > RNonlinearLS > VarietyInNLS

	Size	Modified
	873 B	Jan 21, 2022, 8:25 PM
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astSquaresCod...	408.4 KB	Jan 21, 2022, 8:25 PM
astSquaresCod...	55.2 KB	Jan 21, 2022, 8:25 PM

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function Addins

LinuxOttawaX.Rmd

Knit

```

1 ---
2 title: "LinuxOttawaX"
3 author: "John C Nash"
4 date: "25/01/2022"
5 output: pdf_document
6 ---
7
8 ```{r setup, include=FALSE}
9 knitr::opts_chunk$set(echo = TRUE)
10 ```
11
12 This is a set of instructions for preparing an RMarkdown document.
13
14 # Setup
15
16 You will need to install:
17
18 - R https://cran.r-project.org
19 - Rstudio https://rstudio.com
20
21 You will likely be prompted to install some other software tools e.g., knitr.
22

```

Console Terminal Jobs

R 4.1.2 · ~/current/GSoC2021/RNonlinearLS/

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dnorm(x, mean = 0, sd = 1, log = FALSE)
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qnorm(p, mean = 0, sd = 1, lower.tail = TRUE, log.p = FALSE)
rnorm(n, mean = 0, sd = 1)

```

Arguments

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function

LinuxOttawaX.Rmd

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21 You will likely be prompted to install some other software
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```

1:1 # LinuxOttawaX

Console Terminal R Markdown Jobs

R 4.1.2 · ~/current/GSoC2021/RNonlinearLS/

Type 'contributors()' for more information and 'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or 'help.start()' for an HTML browser interface to help.

Type 'q()' to quit R.

> |

LinuxOttawaX
LinuxOttawaX.pdf

61.8%

Setup

Enter a docum... 1
Can use Git or ... 2
Other useful fe... 2

LinuxOttawaX

John C Nash

25/01/2022

This is a set of instructions for preparing an RMarkdown document.

Setup

You will need to install:

- R <https://cran.r-project.org>
- Rstudio <https://rstudio.com>

You will likely be prompted to install some other software tools e.g., knitr.

Enter a document

Open Rstudio and

File / New File / R Markdown

Give file a name and save after choosing author and output type.

Note that various “chunks” of code can be included.

```
sessionInfo() # tells what our R infrastructure is
```

```
## R version 4.1.2 (2021-11-01)
## Platform: x86_64-pc-linux-gnu (64-bit)
## Running under: Linux Mint 20.3
##
## Matrix products: default
## BLAS: /usr/lib/x86_64-linux-gnu/blas/libblas.so.3.9.0
```

Arguments

RNonlinearLS - main - R... LinuxOttawaX

Tue 25 Jan, 21:10

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function

LinuxOttawaX.Rmd

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100

```

LinuxOttawaX

```

## [13] rlang_0.4.12 evaluate_0.14
myrn <- rnorm(2500, mean=10, sd=1.5)
hist(myrn)

```

Histogram of myrn

Knit the document (button on screen), or Ctrl-Shift-K.

Can use Git or Subversion

Easy to set up with File / New Project.

The interface is actually one of the better ones for GUI version control.

Other useful features

- Latex math can be put into text by surrounding with single or double dollar signs. Use double dollars for separated equations.
- Bibtex references can be included. Put bibliography line in yaml header to give bibtex file name. Citations entered via @name.

Arguments

R 4.1.2 · ~/current/GSoC2021/RNonlinearLS/

Type 'contributors()' for more information and 'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or 'help.start()' for an HTML browser interface to help. Type 'q()' to quit R.

> |