

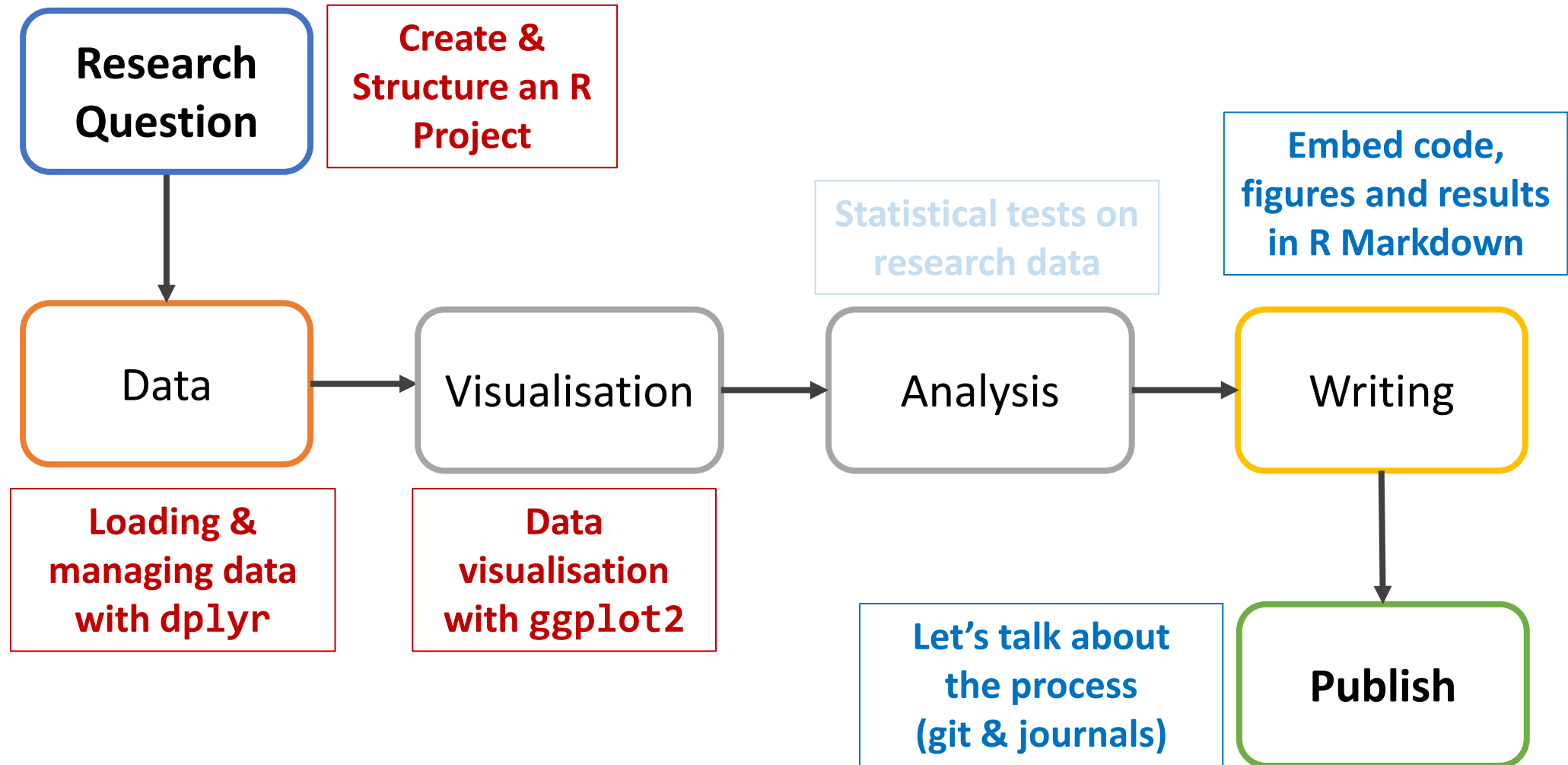


Using R as a Research Tool.

NERC E4 DTP Training – 27st February 2024

Dr Susan Johnston, Institute of Evolutionary Biology

Life of a research project.



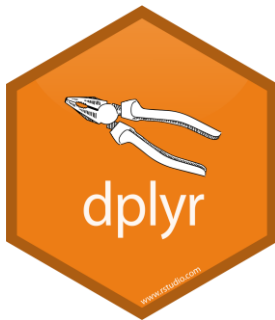
Today's session:



- Fast dynamic report generation.



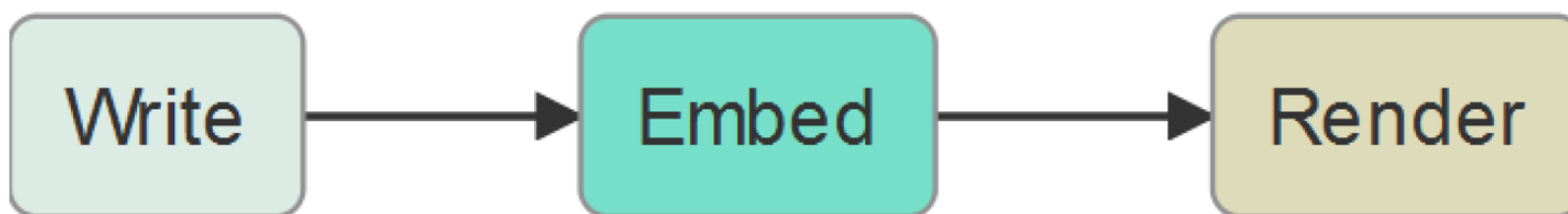
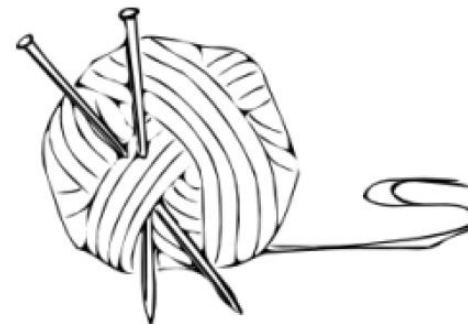
- Version control system.



- Continue data processing and visualization.

knitr

Elegant, flexible and fast
dynamic report generation with R



The knitr package allows R code and document templates to be compiled into a single report containing text, results and figures.

Markdown Language

- Lightweight mark-up language
- Basic text formatting, adding images, creating lists, etc.
- Can embed code and results, making it useful for reproducible research.
- Looks very much like regular text with a few extra characters (#, *, etc)

FilesPlotsPackagesHelpViewer

←→🏠📄

🔍

🔄

Markdown Quick Reference ▾Find in Topic

Markdown Quick Reference

R Markdown is an easy-to-write plain text format for creating dynamic documents and reports. See [Using R Markdown](#) to learn more.

Emphasis

```
*italic*  **bold**  
_italic_  __bold__
```

Headers

```
# Header 1  
## Header 2  
### Header 3
```

Lists

Unordered List

```
* Item 1  
* Item 2  
  + Item 2a  
  + Item 2b
```

Ordered List

```
1. Item 1  
2. Item 2  
3. Item 3  
  + Item 3a  
  + Item 3b
```

Worked example...

What is git ?



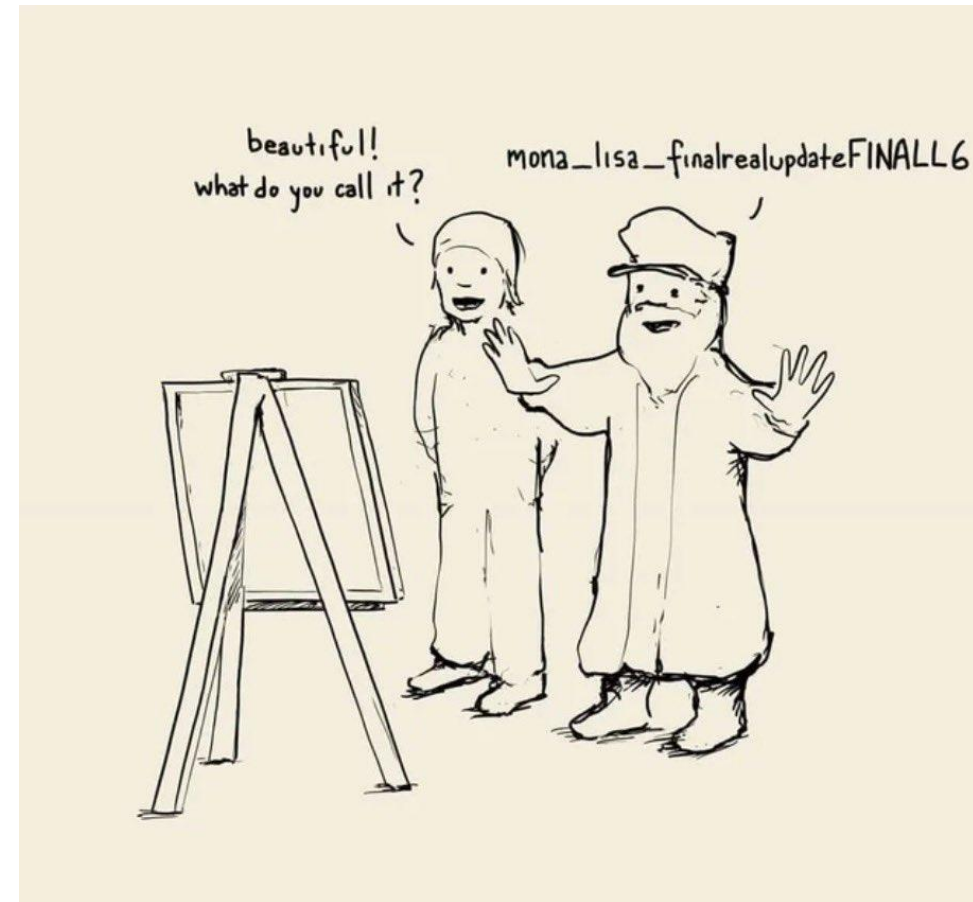
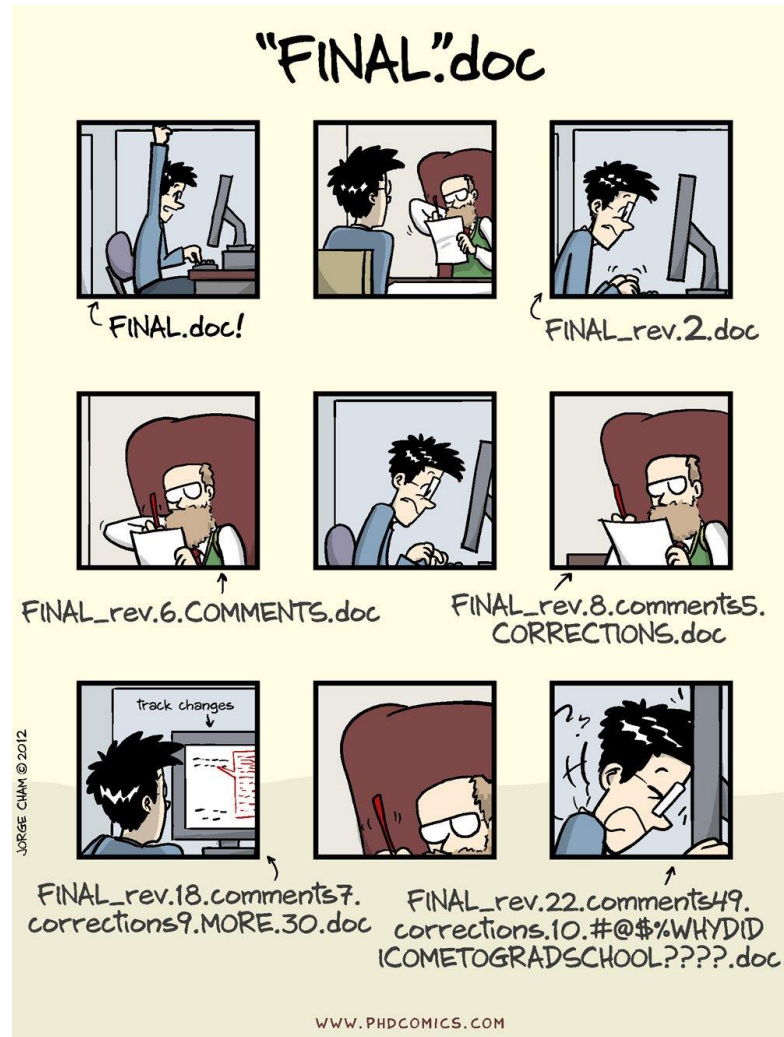
 Search entire site...

Git is a **free and open source** distributed version control system designed to handle everything from small to very large projects with speed and efficiency.

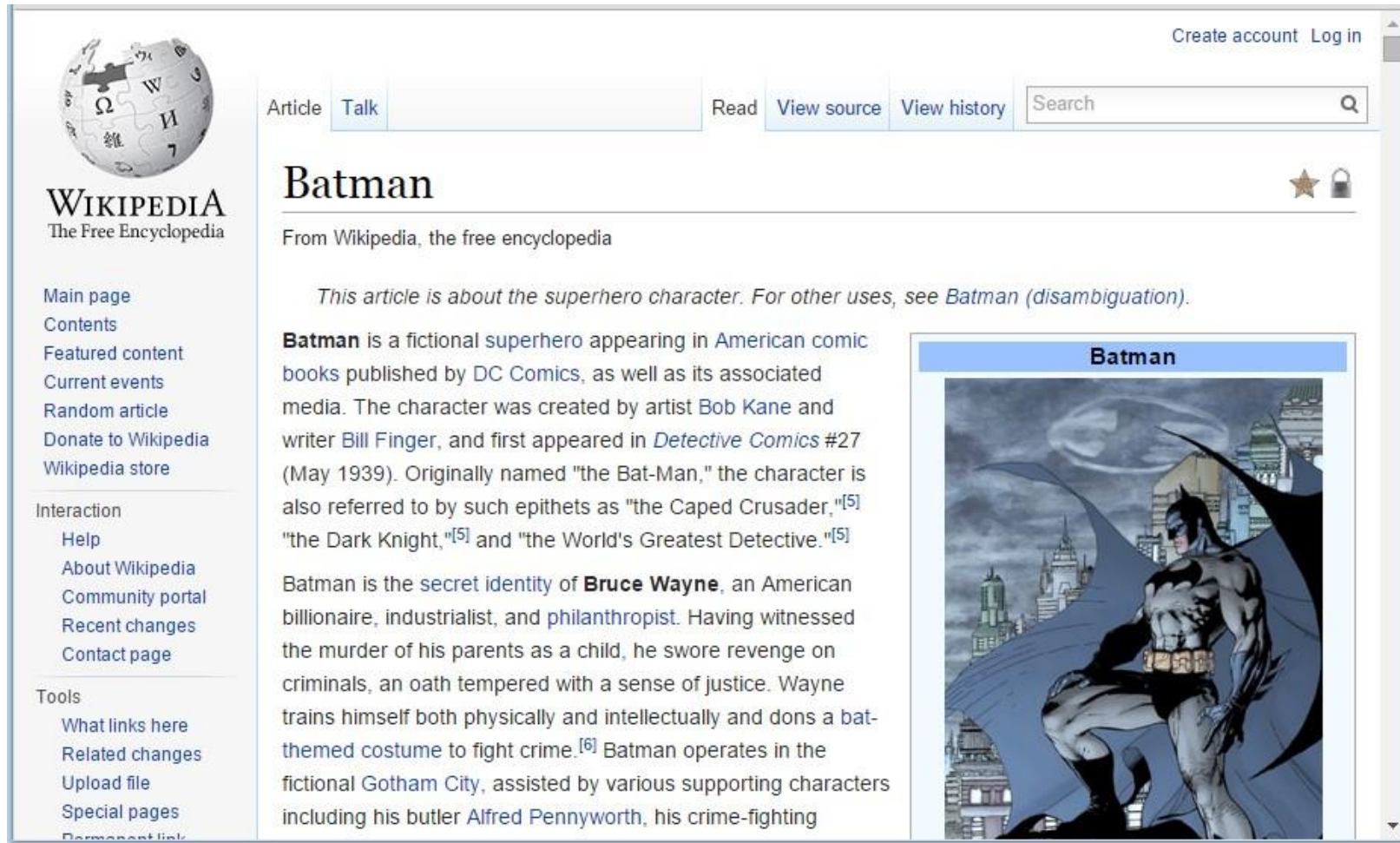
Git is **easy to learn** and has a **tiny footprint with lightning fast performance**. It outclasses SCM tools like Subversion, CVS, Perforce, and ClearCase with features like **cheap local branching**, convenient **staging areas**, and **multiple workflows**.




Version control: keep track of file updates (and revert if needed).



Version control: revert a file to a previous version.



The image is a screenshot of the Wikipedia article for "Batman". At the top left is the Wikipedia logo, a globe made of puzzle pieces with various symbols, and the text "WIKIPEDIA The Free Encyclopedia". To the right of the logo is a sidebar with links: "Main page", "Contents", "Featured content", "Current events", "Random article", "Donate to Wikipedia", "Wikipedia store", "Interaction" (with sub-links "Help", "About Wikipedia", "Community portal", "Recent changes", "Contact page"), and "Tools" (with sub-links "What links here", "Related changes", "Upload file", "Special pages", "Permanent link"). The main content area has a navigation bar with "Article" (selected), "Talk", "Read", "View source", and "View history". To the right of this bar is a search box. Below the navigation bar is the title "Batman" in a large, bold font, followed by the text "From Wikipedia, the free encyclopedia". A star icon and a lock icon are to the right of the title. Below the title is a disambiguation note: "This article is about the superhero character. For other uses, see Batman (disambiguation)." The main text begins with "Batman is a fictional superhero appearing in American comic books published by DC Comics, as well as its associated media. The character was created by artist Bob Kane and writer Bill Finger, and first appeared in *Detective Comics* #27 (May 1939). Originally named 'the Bat-Man,' the character is also referred to by such epithets as 'the Caped Crusader',^[5] 'the Dark Knight',^[5] and 'the World's Greatest Detective.'^[5] Batman is the secret identity of **Bruce Wayne**, an American billionaire, industrialist, and philanthropist. Having witnessed the murder of his parents as a child, he swore revenge on criminals, an oath tempered with a sense of justice. Wayne trains himself both physically and intellectually and dons a bat-themed costume to fight crime.^[6] Batman operates in the fictional Gotham City, assisted by various supporting characters including his butler Alfred Pennyworth, his crime-fighting



The illustration shows Batman in his iconic suit, standing on a rooftop with his cape spread. He is looking towards the viewer. In the background, there is a cityscape with a large, stylized bat symbol in the sky.

Version control: revert a file to a previous version.

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Page information
Wikidata item

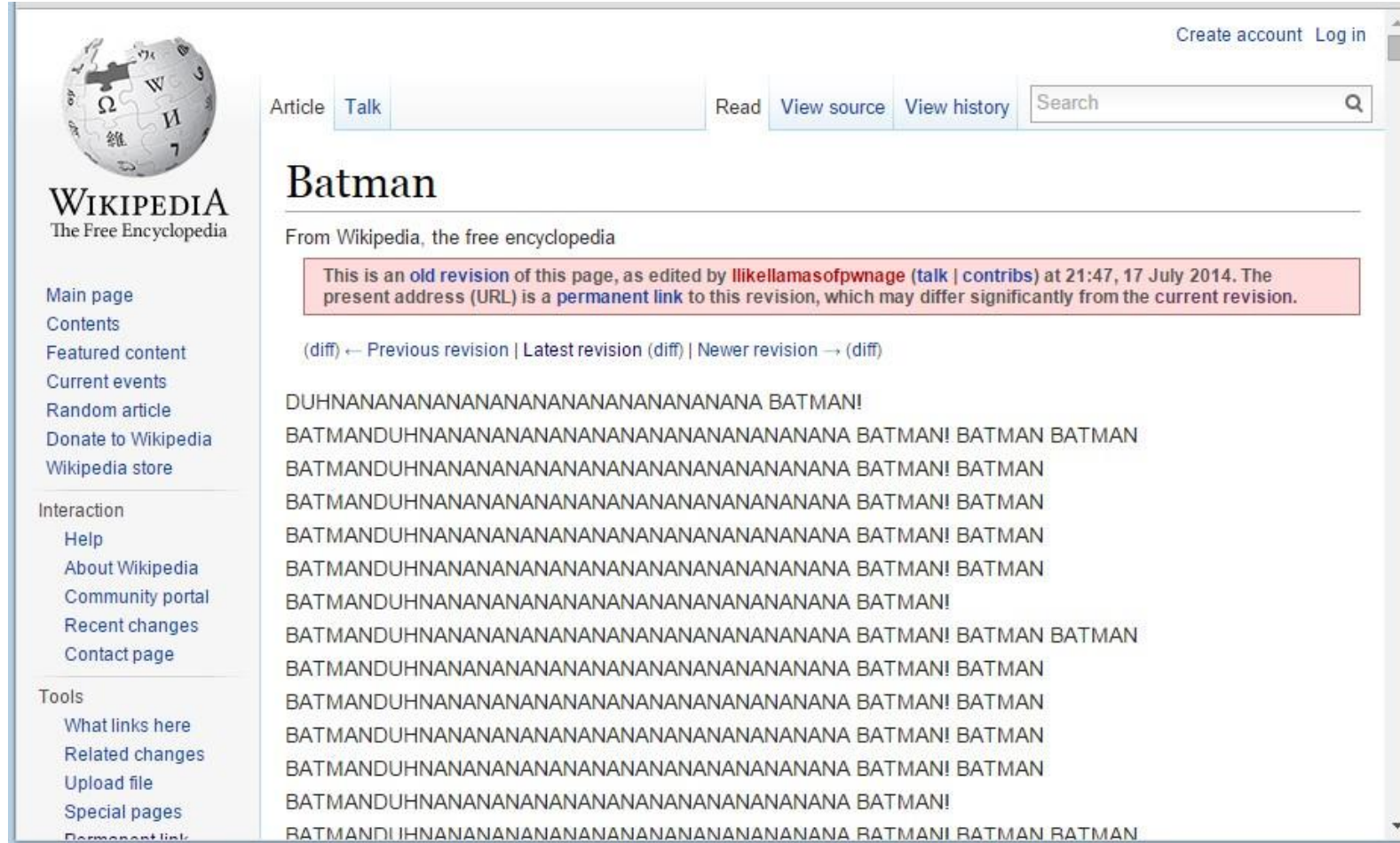
Languages 

m = minor edit, → = section edit, ← = automatic edit summary
(newest | oldest) View (newer 50 | older 50) (20 | 50 | 100 | 250 | 500)

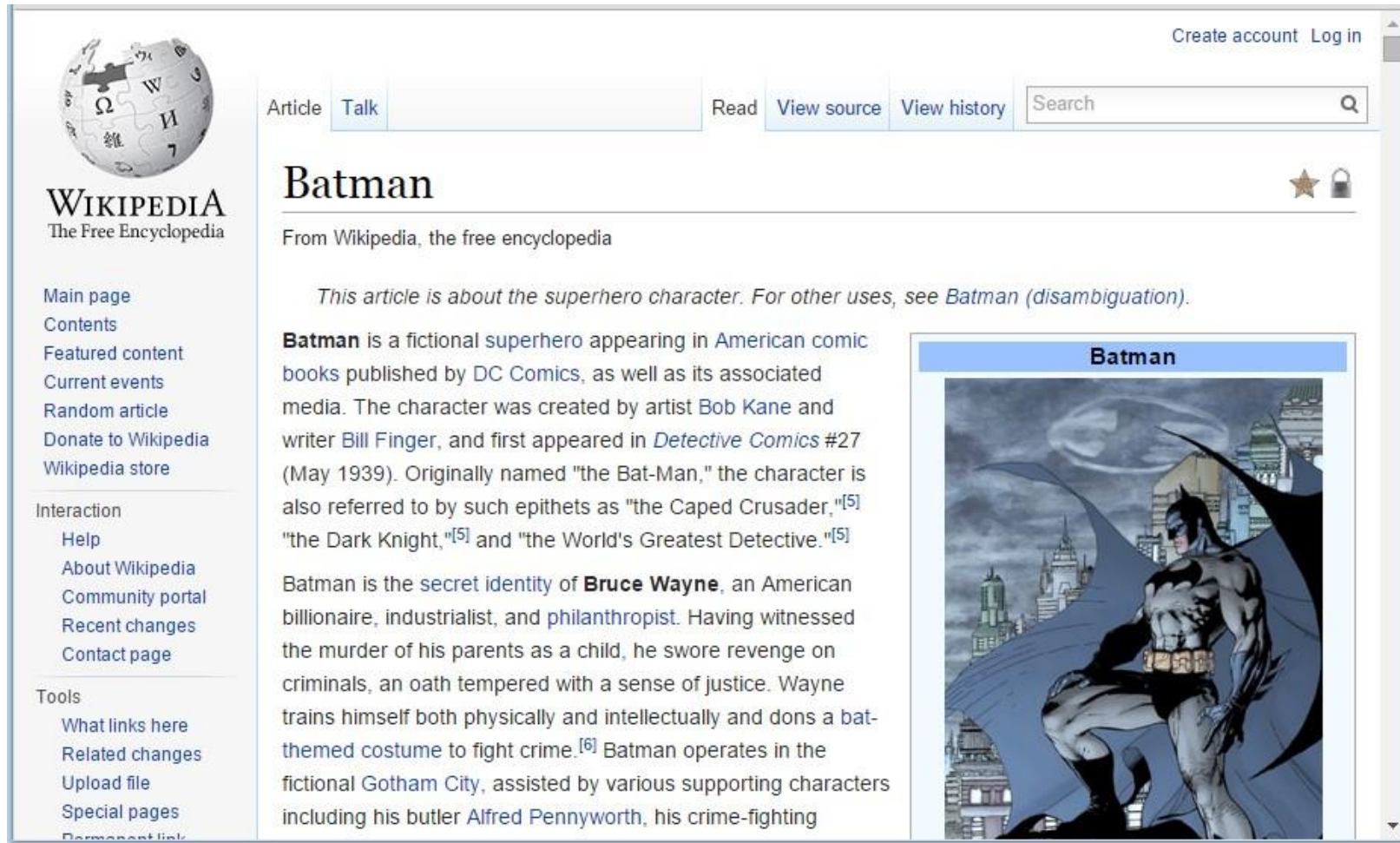
Compare selected revisions

- (cur | prev) ☒ 14:23, 15 April 2015 Kinfol1993 (talk | contribs) **m** ... (118,704 bytes) (+10) ... (→Personality)
- (cur | prev) ☒ 14:20, 15 April 2015 Kinfol1993 (talk | contribs) **m** ... (118,694 bytes) (+5) ... (→Personality)
- (cur | prev) ☐ 14:20, 15 April 2015 Kinfol1993 (talk | contribs) **m** ... (118,689 bytes) (+1) ... (→Personality)
- (cur | prev) ☐ 14:19, 15 April 2015 Kinfol1993 (talk | contribs) ... (118,688 bytes) (+1,063) ... (→Personality: More info on Miller's Batman, original personality)
- (cur | prev) ☐ 13:25, 15 April 2015 Kinfol1993 (talk | contribs) **m** ... (117,625 bytes) (+34) ... (Category:fictional antiheroes per citations at list of fictional antiheroes)
- (cur | prev) ☐ 10:58, 15 April 2015 ProspectofArts (talk | contribs) ... (117,591 bytes) (+4)
- (cur | prev) ☐ 10:57, 15 April 2015 ProspectofArts (talk | contribs) ... (117,587 bytes) (+67)
- (cur | prev) ☐ 15:22, 9 April 2015 JosephSpiral (talk | contribs) ... (117,520 bytes) (+2)
- (cur | prev) ☐ 11:24, 7 April 2015 Brandmeister (talk | contribs) ... (117,518 bytes) (-2,880) ... (more concise plot per tag)
- (cur | prev) ☐ 23:42, 4 April 2015 Samhan Dobo (talk | [contribs](#)) ... (120,398 bytes) (+4) ... (→Skills and abilities)
- (cur | prev) ☐ 14:25, 3 April 2015 JosephSpiral (talk | contribs) ... (120,394 bytes) (0) ... (→Romantic relationships)
- (cur | prev) ☐ 14:24, 3 April 2015 JosephSpiral (talk | contribs) ... (120,394 bytes) (+21) ... (→Romantic

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RStudio: Review Changes

Changes	History	master	(all commits)	Search	Pull
Subject	Author	Date (UTC)	SHA		
HEAD -> path/heads/master origin/master	Added slides	Susan Johnston <Susan.Jk 2018-01-17	0ba28e24		
	Added gradient argument to plot_fibonacci function.	Susan Johnston <Susan.Jk 2018-01-17	282a1a66		
	First commit	Susan Johnston <Susan.Jk 2018-01-17	c21ee800		

Commits 1-3 of 3

SHA 282a1a664c7baa6558d648d0507038c517e13eb8
Author Susan Johnston <Susan.Johnston@ed.ac.uk>
Date (UTC) 2018-01-17 01:38
Subject Added gradient argument to plot_fibonacci function.
Parent c21ee800767ec3014af26ac03d8c941b13a4f364

[R/plot_fibonacci.R](#)
[man/plot_fibonacci.Rd](#)

R/plot_fibonacci.R [View file @ 282a1a66](#)

```
@@ -3,18 +3,26 @@
3 3 #' This function creates a plot for a Fibonacci sequence of a
4 4 #'
5 5 #' @param len numeric. Specify the length of the sequence.
6 6 #' @param gradient logical. Default TRUE. Indicates whether points
7 7 #' should be coloured by gradient.
8 8 #' @import ggplot2
9 9 #' @export
10 10 plot_fibonacci <- function(len){
11 11
12 12 plot_fibonacci <- function(len, gradient = T){
13 13
14 14   require(ggplot2)
15 15
16 16   x <- data.frame(Order = 1:len,
17 17                     Fibonacci.Number = fibonacci(len))
18 18
19 19   ggplot(x, aes(Order, Fibonacci.Number, colour = Order)) +
```