

My Example Computed Manuscript

Created in Rmarkdown

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Abstract A mock computed manuscript created in RStudio using {Rmarkdown}. The {Bookdown} and {Rticles} packages were used to output the text in Springer Nature's desired manuscript format.

Keywords

1 Introduction

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.

Here we'll add some references from Zotero (Perkel 2020): (Fisch et al. 2015; Argelaguet et al. 2021; Lê Cao et al. 2021).

Markdown documents can include inline equations written in \LaTeX , such as $F = ma$. Here is an equation on its own line:

$$a^2 + b^2 = c^2$$

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Table 1 Original subject data

ID	class	wt	—	ID	class	wt	—	ID	class	wt
1	GRP_3	76	—	34	GRP_1	269	—	67	GRP_3	182
2	GRP_3	295	—	35	GRP_3	277	—	68	GRP_3	151
3	GRP_3	186	—	36	GRP_3	159	—	69	GRP_3	295
4	GRP_3	162	—	37	GRP_3	217	—	70	GRP_3	224
5	GRP_2	257	—	38	GRP_3	106	—	71	GRP_3	219
6	GRP_1	278	—	39	GRP_3	98	—	72	GRP_3	158
7	GRP_3	116	—	40	GRP_2	202	—	73	GRP_1	224
8	GRP_3	297	—	41	GRP_3	178	—	74	GRP_3	187
9	GRP_3	75	—	42	GRP_1	142	—	75	GRP_3	186
10	GRP_3	162	—	43	GRP_2	90	—	76	GRP_2	173
11	GRP_1	295	—	44	GRP_3	207	—	77	GRP_1	123
12	GRP_3	144	—	45	GRP_3	138	—	78	GRP_3	216
13	GRP_3	235	—	46	GRP_3	288	—	79	GRP_2	152
14	GRP_3	242	—	47	GRP_3	177	—	80	GRP_3	157
15	GRP_3	179	—	48	GRP_1	132	—	81	GRP_3	291
16	GRP_1	184	—	49	GRP_3	204	—	82	GRP_2	149
17	GRP_3	248	—	50	GRP_3	86	—	83	GRP_1	246
18	GRP_1	273	—	51	GRP_3	294	—	84	GRP_3	287
19	GRP_3	185	—	52	GRP_3	137	—	85	GRP_3	221
20	GRP_3	283	—	53	GRP_2	225	—	86	GRP_3	295
21	GRP_1	259	—	54	GRP_3	84	—	87	GRP_1	243
22	GRP_2	148	—	55	GRP_2	123	—	88	GRP_2	138
23	GRP_2	273	—	56	GRP_3	256	—	89	GRP_1	144
24	GRP_1	295	—	57	GRP_3	180	—	90	GRP_3	156
25	GRP_2	285	—	58	GRP_3	281	—	91	GRP_3	109
26	GRP_3	211	—	59	GRP_2	179	—	92	GRP_2	138
27	GRP_2	79	—	60	GRP_3	288	—	93	GRP_1	162
28	GRP_3	192	—	61	GRP_3	84	—	94	GRP_3	87
29	GRP_2	236	—	62	GRP_3	296	—	95	GRP_2	176
30	GRP_1	201	—	63	GRP_2	108	—	96	GRP_3	232
31	GRP_2	224	—	64	GRP_2	197	—	97	GRP_1	122
32	GRP_2	161	—	65	GRP_3	297	—	98	GRP_1	249
33	GRP_1	189	—	66	GRP_3	179	—	99	GRP_3	226

2 Results

2.1 Inline computation

One ‘killer feature’ of computed manuscripts is the ability to compute and insert values into the text rather than requiring authors to input them manually. That circumvents the possibility that the author will enter an incorrect number, or forget to update them should new data arise.

For instance, imagine we are analyzing data from a clinical trial:

We have **99** subjects in our study (Table 1). The average weight is **196.17** (range: **75-297**). (The numbers in **bold face type** are computed values.)

Now suppose we get another tranche of data:

Table 2 New subject data

ID	class	wt	—	ID	class	wt	—	ID	class	wt
1	GRP_3	292	—	21	GRP_3	251	—	41	GRP_3	100
2	GRP_3	167	—	22	GRP_2	149	—	42	GRP_1	76
3	GRP_2	115	—	23	GRP_2	269	—	43	GRP_3	208
4	GRP_3	199	—	24	GRP_3	207	—	44	GRP_3	128
5	GRP_3	238	—	25	GRP_3	197	—	45	GRP_2	123
6	GRP_1	202	—	26	GRP_2	116	—	46	GRP_3	159
7	GRP_3	103	—	27	GRP_2	78	—	47	GRP_2	228
8	GRP_3	232	—	28	GRP_1	82	—	48	GRP_1	78
9	GRP_1	103	—	29	GRP_3	219	—	49	GRP_3	189
10	GRP_3	169	—	30	GRP_3	235	—	50	GRP_2	265
11	GRP_3	291	—	31	GRP_3	280	—	51	GRP_3	93
12	GRP_3	226	—	32	GRP_1	208	—	52	GRP_3	78
13	GRP_1	97	—	33	GRP_2	119	—	53	GRP_3	196
14	GRP_3	173	—	34	GRP_3	240	—	54	GRP_3	278
15	GRP_2	99	—	35	GRP_3	225	—	55	GRP_3	226
16	GRP_3	186	—	36	GRP_3	297	—	56	GRP_3	214
17	GRP_3	183	—	37	GRP_1	162	—	57	GRP_3	261
18	GRP_3	132	—	38	GRP_3	237	—	58	GRP_3	272
19	GRP_2	278	—	39	GRP_3	226	—	59	GRP_1	298
20	GRP_3	112	—	40	GRP_3	168	—	60	GRP_3	109

There are **60** subjects in this new dataset (Table 2). Their average weight is **185.68** (range: **76-298**).

Combining the two datasets, we have a total of **159** subjects. The revised average weight is **192.21** (range: **75-298**).

2.2 The Fibonacci sequence

As Rmarkdown documents can do anything R can do, we can also create and include figures. For instance, we can calculate the first **25** numbers in the Fibonacci sequence. The data are shown in Figure 1. Note that this figure number (as well as the table numbers above) are automatically generated.

3 Methods

The following code was used in section 2.1 to create the original clinical trial data:

```
# create a mock dataset
n_subjs <- 99
subjID <- 1:n_subjs

# generate 99 random #s between 0 and 10
```

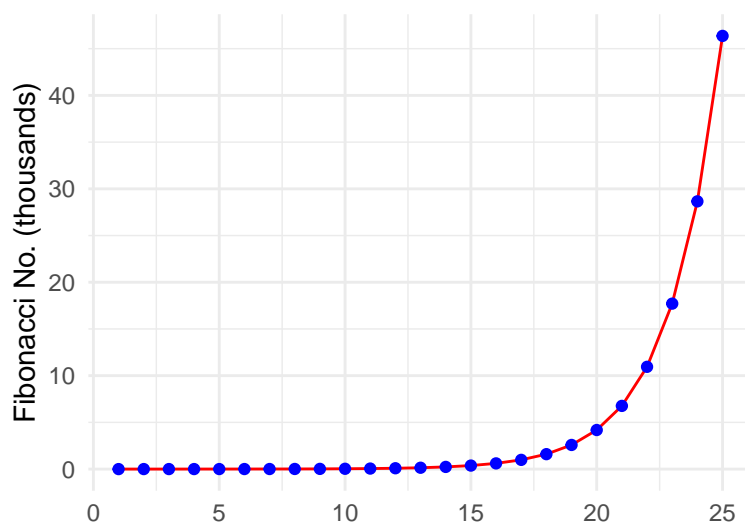


Fig. 1 The first 26 numbers of the Fibonacci sequence

```
tmp <- floor(runif(n_subjs, min = 0, max = 10))
# assign those numbers to any of 3 subject groups
fn <- function(x) {
  if (x > 7) 'GRP_1'
  else if (x > 5) 'GRP_2'
  else 'GRP_3'
}
subj_class <- sapply(tmp, fn)

# pick random weights between 75 and 300
wts <- floor(runif(n_subjs, min = 75, max = 300))
# combine the data into a table
df <- data.frame(ID = subjID, class = subj_class, wt = wts)

# display the table, splitting the 99 rows into 3 cols wide
tmp <- cbind(df[1:33,], rep(' ', 33),
             df[34:66,], rep(' ', 33),
             df[67:99,])
names(tmp) <- c('ID', 'class', 'wt', ' ', 'ID', 'class', 'wt',
               ' ', 'ID', 'class', 'wt')
knitr::kable(tmp, format = 'latex', booktabs = TRUE,
             caption = "Original subject data")
```

The following code was used in section 2.2 to calculate and plot the Fibonacci sequence:

```
# calculate the first `n` Fibonacci numbers
fibonacci <- function(n) {
  stopifnot(n > 2)
  ar <- rep(0, n)
  ar[1] <- f1 <- 0
  ar[2] <- f2 <- 1
  for (i in 3:n) {
    f3 <- f1 + f2
    ar[i] <- f3
    f1 <- f2
    f2 <- f3
  }
  return (ar)
}

ncalc <- 25
f <- fibonacci(ncalc)
df <- data.frame(1:ncalc, f)
names(df) <- c("x", "y")

div <- 1000

p <- ggplot(df) +
  geom_line(aes(x, y/div), color = "red") +
  geom_point(aes(x, y/div), color = "blue") +
  scale_y_continuous(limits = c(0, max(df$y)/div)) +
  xlab("") +
  ylab("Fibonacci No. (thousands)") +
  theme_minimal()
p
```

References

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