R Markdown Example of PDF

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1 Contents

This R Markdown file (.Rmd) contains a brief overview of R Markdown files and exmples of:

- basic markdown
- how to include code:
  - inline
  - chunks & options
- formulas with LaTeX
- including figures (and references, e.g. "In Figure X, we see. . . ")
- including tables (and references, e.g., "Results are shown in Table X. . . ")
- cross-references for sections (with links)

Brief note: This file actually uses the R package `bookdown` (as opposed to the `rmarkdown` package) which provides a few more bells and whistles, particularly for creating academic articles. For more details, check out the The Definitive Guide.

2 Brief Overview

3 Markdown

Examples in a nested list:

- Bold
  - **two asterisks** or **two underscores**
  - **2 **** and this is regular type face
  - test
  - is this red? – need xcolor LaTeXpackage
- Italics
  - *italics* or *italics*
- Links: IPR
- Sections: pound signs / hashtags / #

4 Formulas with LaTeX

$Y_i = \alpha + \beta_1 * x_{1,i} + \beta_2 * x_{2,i} + \epsilon_i$

Where $e \sim \text{Normal}(\mu, \sigma)$.

5 Code

This section has 2 subsections that provide examples of including (1) inline code and (2) code chunks.

5.1 Inline Code

Let's take a look at the mtcars data set which has 32 observations and 11 variables.

5.2 Code Chunks

```
summary(cars)
```

```
##      speed           dist
##  Min.   : 4.0   Min.   :  2.00
##  1st Qu.:12.0   1st Qu.: 26.00
##  Median :15.0   Median : 36.00
##  Mean   :15.4   Mean   : 42.98
##  3rd Qu.:19.0   3rd Qu.: 56.00
##  Max.   :25.0   Max.   :120.00
```

What if we **don't want the r code**?

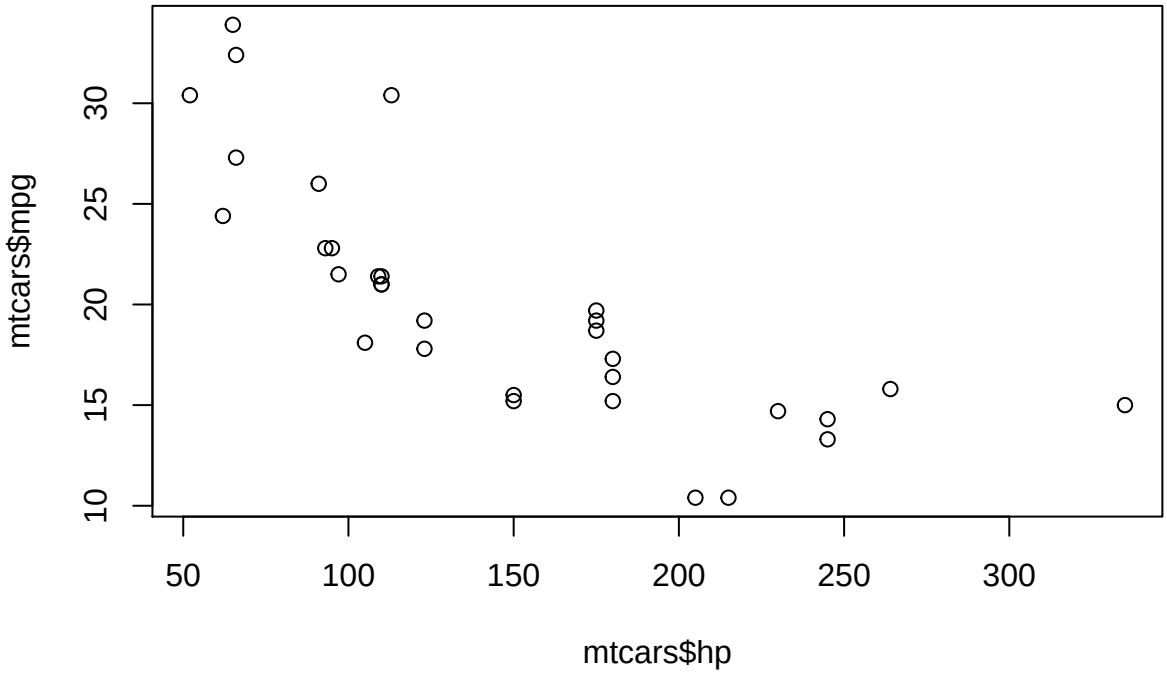
```
##      speed           dist
##  Min.   : 4.0   Min.   :  2.00
##  1st Qu.:12.0   1st Qu.: 26.00
##  Median :15.0   Median : 36.00
##  Mean   :15.4   Mean   : 42.98
##  3rd Qu.:19.0   3rd Qu.: 56.00
##  Max.   :25.0   Max.   :120.00
```

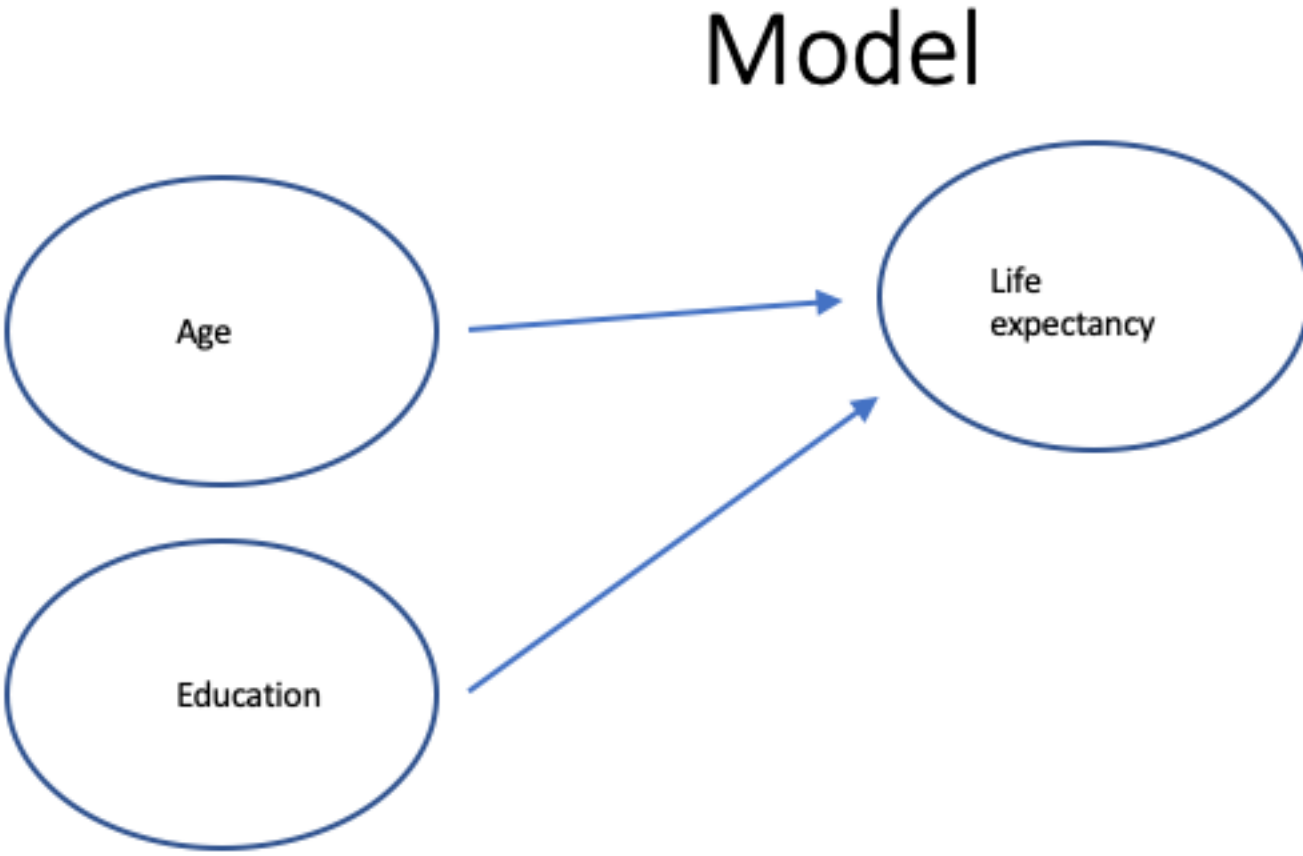
What if we **don't want the results**?

```
new_var <- mtcars$mpg - mean(mtcars$mpg)
```

Did it work? If so we should see that the mean of a centered variable is $4.4408921 \times 10^{-16}$.

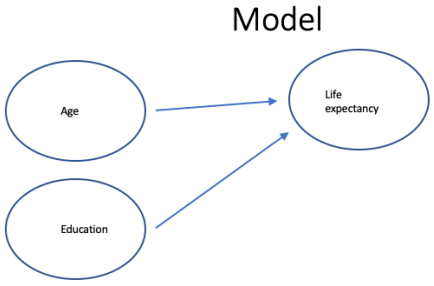
6 Plots





We can also automatically number and reference our figures and tables.[1] Note that Figure 1 is a little smaller and has a caption.

Fig. 1: Earth-shattering model



[1]This gives me a LaTeX Warning about multiply-defined labels, which is slightly annoying.

	Mean	Std Dev
mpg	20.090625	6.0269480520891
cyl	6.1875	1.78592164694654
disp	230.721875	123.938693831382
hp	146.6875	68.5628684893206
drat	3.5965625	0.534678736070971
wt	3.21725	0.978457442989697
qsec	17.84875	1.78694323609684
vs	0.4375	0.504016128774185
am	0.40625	0.498990917235846
gear	3.6875	0.737804065256947
carb	2.8125	1.61519997763185

Table 1: Descriptive Statistics

7 Tables

Check out Table 1

```
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
newDF <- mtcars %>% summarize(across(where(is.numeric), list(mean = mean, sd = sd)))
tab1 <- matrix(newDF, nrow = ncol(mtcars), byrow = TRUE)
rownames(tab1) <- names(mtcars)
colnames(tab1) <- c('Mean', 'Std Dev')
kable(tab1, caption  = "Descriptive Statistics")
```

This is *much* easier with the stargazer (which has a useful vignette).

```
library(stargazer)
```

```
##
## Please cite as:
```

```
##  Hlavac, Marek (2018). stargazer: Well-Formatted Regression and Summary Statistics Ta
```

```
##  R package version 5.2.2. https://CRAN.R-project.org/package=stargazer
```

```
stargazer(mtcars, header = FALSE, type = "latex")
```

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
mpg	32	20.091	6.027	10	15.4	22.8	34
cyl	32	6.188	1.786	4	4	8	8
disp	32	230.722	123.939	71	120.8	326	472
hp	32	146.688	68.563	52	96.5	180	335
drat	32	3.597	0.535	2.760	3.080	3.920	4.930
wt	32	3.217	0.978	1.513	2.581	3.610	5.424
qsec	32	17.849	1.787	14.500	16.892	18.900	22.900
vs	32	0.438	0.504	0	0	1	1
am	32	0.406	0.499	0	0	1	1
gear	32	3.688	0.738	3	3	4	5
carb	32	2.812	1.615	1	2	4	8

Table 2

```
mod1 <- lm(mpg ~ wt, data = mtcars)
mod2 <- lm(mpg ~ wt + hp, data = mtcars)
stargazer(mod1, mod2, header = FALSE, type = "latex")
```

8 Cross-References for Sections

We need to label the section. For example, remember the earlier section Code Chunks? Here is a link to Code Chunks

	Dependent variable:	
	mpg	
	(1)	(2)
wt	-5.344^{***}	-3.878^{***}
	(0.559)	(0.633)
hp		-0.032^{***}
		(0.009)
Constant	37.285^{***}	37.227^{***}
	(1.878)	(1.599)
Observations	32	32
R^2	0.753	0.827
Adjusted R^2	0.745	0.815
Residual Std. Error	3.046 (df = 30)	2.593 (df = 29)
F Statistic	91.375^{***} (df = 1; 30)	69.211^{***} (df = 2; 29)
Note:		*p<0.1; **p<0.05; ***p<0.01

Table 3