

My R Markdown Primer

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Introduction

R Markdown mixes narrative, code, and output.
It makes analysis reproducible.
You can knit to HTML or PDF and share the result.

Quick math examples

Inline example: $\alpha + \beta = \gamma$.

Displayed equation:

$$\bar{x} = \frac{1}{n} \sum_{i=1}^n x_i$$

Load data and show summary

```
# load dataset and show first rows and basic summary
data("mtcars", package = "datasets")
head(mtcars)

##          mpg cyl disp  hp drat    wt  qsec vs am gear carb
## Mazda RX4     21.0   6 160 110 3.90 2.620 16.46  0  1    4    4
## Mazda RX4 Wag 21.0   6 160 110 3.90 2.875 17.02  0  1    4    4
## Datsun 710    22.8   4 108  93 3.85 2.320 18.61  1  1    4    1
## Hornet 4 Drive 21.4   6 258 110 3.08 3.215 19.44  1  0    3    1
## Hornet Sportabout 18.7   8 360 175 3.15 3.440 17.02  0  0    3    2
## Valiant       18.1   6 225 105 2.76 3.460 20.22  1  0    3    1

summary(mtcars$mpg)

##      Min. 1st Qu. Median      Mean 3rd Qu.      Max.
## 10.40   15.43  19.20   20.09  22.80   33.90
```

Compute simple statistics

```
# compute mean and sd of mpg and group means by cyl
mean_mpg <- mean(mtcars$mpg, na.rm = TRUE)
sd_mpg <- sd(mtcars$mpg, na.rm = TRUE)
group_means <- aggregate(mpg ~ cyl, data = mtcars, FUN = mean)
mean_mpg
```

```

## [1] 20.09062
sd_mpg

## [1] 6.026948
group_means

##   cyl      mpg
## 1    4 26.66364
## 2    6 19.74286
## 3    8 15.10000

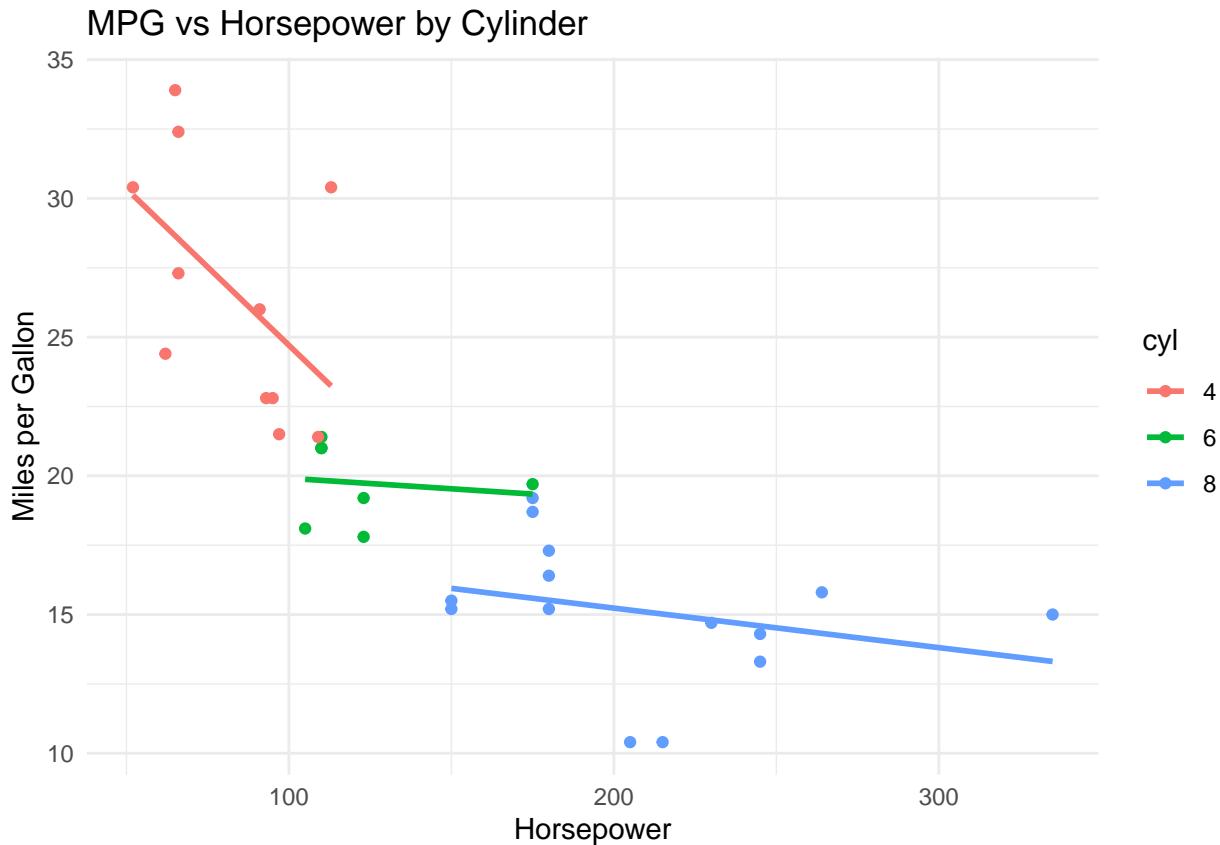
```

Make a quick ggplot

```

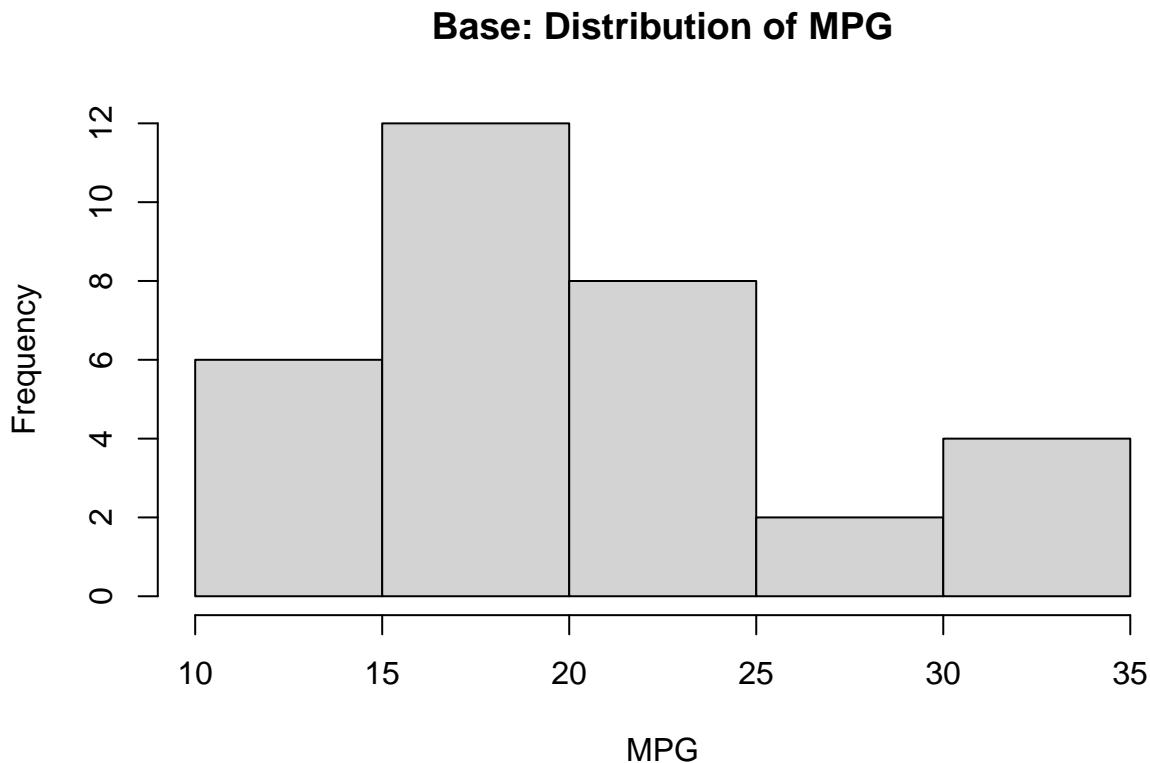
# create a scatter with trend lines colored by cylinder
if (!requireNamespace("ggplot2", quietly = TRUE)) install.packages("ggplot2")
library(ggplot2)
ggplot(mtcars, aes(x = hp, y = mpg, color = factor(cyl))) +
  geom_point() +
  geom_smooth(method = "lm", se = FALSE) +
  labs(title = "MPG vs Horsepower by Cylinder",
       x = "Horsepower",
       y = "Miles per Gallon",
       color = "cyl") +
  theme_minimal()

```



Small base R plot

```
# simple base histogram of mpg
hist(mtcars$mpg,
      breaks = 8,
      main = "Base: Distribution of MPG",
      xlab = "MPG")
```



Reflection

R Markdown kept code and text together.
Knitting produced an HTML file with code output and plots.
I liked that I can edit code and re-knit to update results.
One tip. Run chunks interactively first to catch errors before knitting.

Session info

```
sessionInfo()

## R version 4.2.3 (2023-03-15)
## Platform: x86_64-apple-darwin17.0 (64-bit)
## Running under: macOS Big Sur ... 10.16
##
## Matrix products: default
## BLAS:    /Library/Frameworks/R.framework/Versions/4.2/Resources/lib/libRblas.0.dylib
## LAPACK:  /Library/Frameworks/R.framework/Versions/4.2/Resources/lib/libRlapack.dylib
##
## locale:
```

```
## [1] en_US.UTF-8/en_US.UTF-8/en_US.UTF-8/C/en_US.UTF-8/en_US.UTF-8
##
## attached base packages:
## [1] stats      graphics   grDevices utils      datasets   methods    base
##
## other attached packages:
## [1] ggplot2_3.5.1
##
## loaded via a namespace (and not attached):
## [1] highr_0.10      pillar_1.9.0     compiler_4.2.3   tools_4.2.3
## [5] digest_0.6.33   evaluate_1.0.3   lifecycle_1.0.4 tibble_3.2.1
## [9] gtable_0.3.4    nlme_3.1-162    lattice_0.20-45 mgcv_1.8-42
## [13] pkgconfig_2.0.3 rlang_1.1.2     Matrix_1.5-3    cli_3.6.2
## [17] rstudioapi_0.16.0 yaml_2.3.8      xfun_0.49       fastmap_1.2.0
## [21] withr_3.0.2     dplyr_1.1.4     knitr_1.45     generics_0.1.3
## [25] vctrs_0.6.5     grid_4.2.3      tidyselect_1.2.0 glue_1.6.2
## [29] R6_2.5.1        fansi_1.0.6     rmarkdown_2.28   farver_2.1.1
## [33] magrittr_2.0.3   scales_1.3.0    htmltools_0.5.8.1 splines_4.2.3
## [37] colorspace_2.1-0 labeling_0.4.3   utf8_1.2.4      munsell_0.5.1
```