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## R Markdown

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>.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

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

## Including Plots

You can also embed plots, for example:



Note that the echo = FALSE parameter was added to the code chunk to prevent printing of the R code that generated the plot.

library(tidyverse)

## ── Attaching packages ─────────────────────────────────────── tidyverse 1.3.2 ──  
## ✔ ggplot2 3.3.6 ✔ purrr 0.3.4   
## ✔ tibble 3.1.8 ✔ dplyr 1.0.10  
## ✔ tidyr 1.2.0 ✔ stringr 1.4.1   
## ✔ readr 2.1.2 ✔ forcats 0.5.2   
## ── Conflicts ────────────────────────────────────────── tidyverse\_conflicts() ──  
## ✖ dplyr::filter() masks stats::filter()  
## ✖ dplyr::lag() masks stats::lag()

library(dslabs)  
data("murders")  
murders

## state abb region population total  
## 1 Alabama AL South 4779736 135  
## 2 Alaska AK West 710231 19  
## 3 Arizona AZ West 6392017 232  
## 4 Arkansas AR South 2915918 93  
## 5 California CA West 37253956 1257  
## 6 Colorado CO West 5029196 65  
## 7 Connecticut CT Northeast 3574097 97  
## 8 Delaware DE South 897934 38  
## 9 District of Columbia DC South 601723 99  
## 10 Florida FL South 19687653 669  
## 11 Georgia GA South 9920000 376  
## 12 Hawaii HI West 1360301 7  
## 13 Idaho ID West 1567582 12  
## 14 Illinois IL North Central 12830632 364  
## 15 Indiana IN North Central 6483802 142  
## 16 Iowa IA North Central 3046355 21  
## 17 Kansas KS North Central 2853118 63  
## 18 Kentucky KY South 4339367 116  
## 19 Louisiana LA South 4533372 351  
## 20 Maine ME Northeast 1328361 11  
## 21 Maryland MD South 5773552 293  
## 22 Massachusetts MA Northeast 6547629 118  
## 23 Michigan MI North Central 9883640 413  
## 24 Minnesota MN North Central 5303925 53  
## 25 Mississippi MS South 2967297 120  
## 26 Missouri MO North Central 5988927 321  
## 27 Montana MT West 989415 12  
## 28 Nebraska NE North Central 1826341 32  
## 29 Nevada NV West 2700551 84  
## 30 New Hampshire NH Northeast 1316470 5  
## 31 New Jersey NJ Northeast 8791894 246  
## 32 New Mexico NM West 2059179 67  
## 33 New York NY Northeast 19378102 517  
## 34 North Carolina NC South 9535483 286  
## 35 North Dakota ND North Central 672591 4  
## 36 Ohio OH North Central 11536504 310  
## 37 Oklahoma OK South 3751351 111  
## 38 Oregon OR West 3831074 36  
## 39 Pennsylvania PA Northeast 12702379 457  
## 40 Rhode Island RI Northeast 1052567 16  
## 41 South Carolina SC South 4625364 207  
## 42 South Dakota SD North Central 814180 8  
## 43 Tennessee TN South 6346105 219  
## 44 Texas TX South 25145561 805  
## 45 Utah UT West 2763885 22  
## 46 Vermont VT Northeast 625741 2  
## 47 Virginia VA South 8001024 250  
## 48 Washington WA West 6724540 93  
## 49 West Virginia WV South 1852994 27  
## 50 Wisconsin WI North Central 5686986 97  
## 51 Wyoming WY West 563626 5

murders\_tibble <- as\_tibble(murders)  
murders\_tibble

## # A tibble: 51 × 5  
## state abb region population total  
## <chr> <chr> <fct> <dbl> <dbl>  
## 1 Alabama AL South 4779736 135  
## 2 Alaska AK West 710231 19  
## 3 Arizona AZ West 6392017 232  
## 4 Arkansas AR South 2915918 93  
## 5 California CA West 37253956 1257  
## 6 Colorado CO West 5029196 65  
## 7 Connecticut CT Northeast 3574097 97  
## 8 Delaware DE South 897934 38  
## 9 District of Columbia DC South 601723 99  
## 10 Florida FL South 19687653 669  
## # … with 41 more rows

murders\_tibble %>% group\_by(region)

## # A tibble: 51 × 5  
## # Groups: region [4]  
## state abb region population total  
## <chr> <chr> <fct> <dbl> <dbl>  
## 1 Alabama AL South 4779736 135  
## 2 Alaska AK West 710231 19  
## 3 Arizona AZ West 6392017 232  
## 4 Arkansas AR South 2915918 93  
## 5 California CA West 37253956 1257  
## 6 Colorado CO West 5029196 65  
## 7 Connecticut CT Northeast 3574097 97  
## 8 Delaware DE South 897934 38  
## 9 District of Columbia DC South 601723 99  
## 10 Florida FL South 19687653 669  
## # … with 41 more rows

exp(mean(log(murders$population)))

## [1] 3675209

murders %>%  
 .$population%>%  
 log %>%  
 mean %>%  
 exp

## [1] 3675209

library(dplyr)  
library(purrr)  
df <-1:100 %>%   
map\_df(~ tibble(n =(.x), s\_n=(.x )\*(.x+1)/2, s\_n\_2=(((.x)\*(.x+1)/2)\*((.x )\*(.x+1)/2))))  
print(df[1:100,])

## # A tibble: 100 × 3  
## n s\_n s\_n\_2  
## <int> <dbl> <dbl>  
## 1 1 1 1  
## 2 2 3 9  
## 3 3 6 36  
## 4 4 10 100  
## 5 5 15 225  
## 6 6 21 441  
## 7 7 28 784  
## 8 8 36 1296  
## 9 9 45 2025  
## 10 10 55 3025  
## # … with 90 more rows