Quarto tables, figures, and stats

Chunks can produce figures and tables

```{r}
#| label: tbl-one
#| tbl-cap: "This is a great table"
knitr::kable(mtcars)
```

Table 1: This is a great table

	mpg	cyl	disp	hp	drat	wt	qse
Mazda RX4	21.0	6	160.0	110	3.90	2.620	16.4(
Mazda RX4 Wag	21.0	6	160.0	110	3.90	2.875	17.0;
Datsun 710	22.8	4	108.0	93	3.85	2.320	18.6
Hornet 4 Drive	21.4	6	258.0	110	3.08	3.215	19.44

	mpg	cyl	disp	hp	drat	wt	qse
Hornet Sportabout	18.7	8	360.0	175	3.15	3.440	17.0:
Valiant	18.1	6	225.0	105	2.76	3.460	20.2:
Duster 360	14.3	8	360.0	245	3.21	3.570	15.84
Merc 240D	24.4	4	146.7	62	3.69	3.190	20.00
Merc 230	22.8	4	140.8	95	3.92	3.150	22.90
Merc 280	19.2	6	167.6	123	3.92	3.440	18.30
Merc 280C	17.8	6	167.6	123	3.92	3.440	18.90
Merc 450SE	16.4	8	275.8	180	3.07	4.070	17.40
Merc 450SL	17.3	8	275.8	180	3.07	3.730	17.60

	mpg	cyl	disp	hp	drat	wt	qse
Merc 450SLC	15.2	8	275.8	180	3.07	3.780	18.00
Cadillac Fleetwood	10.4	8	472.0	205	2.93	5.250	17.98
Lincoln Continental	10.4	8	460.0	215	3.00	5.424	17.82
Chrysler Imperial	14.7	8	440.0	230	3.23	5.345	17.42
Fiat 128	32.4	4	78.7	66	4.08	2.200	19.47
Honda Civic	30.4	4	75.7	52	4.93	1.615	18.52

	mpg	cyl	disp	hp	drat	wt	qsec
Toyota Corolla	33.9	4	71.1	65	4.22	1.835	19.90
Toyota Corona	21.5	4	120.1	97	3.70	2.465	20.0
Dodge Challenger	15.5	8	318.0	150	2.76	3.520	16.87
AMC Javelin	15.2	8	304.0	150	3.15	3.435	17.30
Camaro Z28	13.3	8	350.0	245	3.73	3.840	15.4
Pontiac Firebird	19.2	8	400.0	175	3.08	3.845	17.05

	mpg	cyl	disp	hp	drat	wt	qse
Fiat X1-9	27.3	4	79.0	66	4.08	1.935	18.90
Porsche 914-2	26.0	4	120.3	91	4.43	2.140	16.70
Lotus Europa	30.4	4	95.1	113	3.77	1.513	16.90
Ford Pantera L	15.8	8	351.0	264	4.22	3.170	14.50
Ferrari Dino	19.7	6	145.0	175	3.62	2.770	15.50
Maserati Bora	15.0	8	301.0	335	3.54	3.570	14.60
Volvo 142E	21.4	4	121.0	109	4.11	2.780	18.60

Chunks can produce figures or tables

```r
1  ```{r}
2  #| label: fig-hist
3  #| fig-cap: "This is a histogram"
4  hist(rnorm(100))
5  ```
```
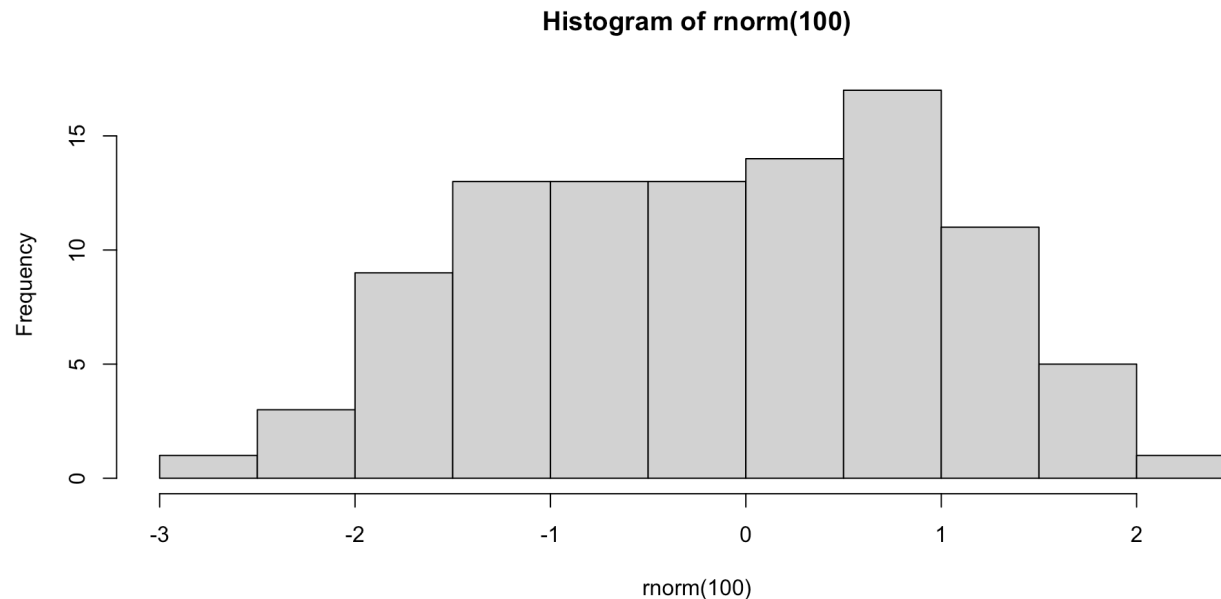

Figure 1: This is a histogram

Cross-referencing

You can then refer to those with `@tbl-one` and `@fig-hist` and the Table and Figure ordering will be correct (and linked)

```
@fig-hist contains a histogram and @tbl-one a table.
```

gets printed as:

Figure 1 contains a histogram and Table 1 a table.

Inline R

Along with just regular text, you can also run R code *within* the text:

```
There were `r 3 + 4` participants
```

becomes:

There were 7 participants

Inline R

This is helpful for reporting statistics, e.g. the sample size:

```
There were `r nrow(nlsy)` participants
```

becomes:

There were 1.2686^{4} participants

Inline stats

You can also create an object in a chunk and then reference it later in the text

```r
total_sample <- nrow(nlsy)
```

There were `r total_sample` participants

Inline stats (aside)

I often create a list of stats that I want to report in a manuscript:

```
1  stats <- list(n = nrow(data),
2                 mean_age = mean(data$age))
```

I can then print these numbers in the text with:

There were `r stats$n` participants with a mean age of `r stats$mean_age`.

which turns into:

There were 1123 participants with a mean age of 43.5.

Inline stats from {gtsummary}

We saw very, very briefly yesterday:

```r
 1  library(gtsummary)
 2  income_table <- tbl_uvregression(
 3    nlsy,
 4    y = income,
 5    include = c(
 6      sex_cat, race_eth_cat,
 7      eyesight_cat, income, age_bir
 8    ),
 9    method = lm
10  )
```

```r
 1  inline_text(income_table, variable = "age_bir")
```

```
[1] "595 (95% CI 538, 652; p<0.001)"
```

We pulled a statistic from our univariate table

If we're making a table, we probably want to report numbers from it

```r
1  ```{r}
2  #| label: tbl-descr
3  #| tbl-cap: "Descriptive statistics"
4  #| output-location: slide
5  table1 <- tbl_summary(
6    nlsy,
7    by = sex_cat,
8    include = c(sex_cat, race_eth_cat, region_cat,
9               eyesight_cat, glasses, age_bir)) |>
10   add_overall(last = TRUE)
11 table1
12 ```
```

If we're making a table, we probably want to report numbers from it

Table 2: Descriptive statistics

Characteristic	Male N = 6,403 [1]	Female N = 6,283 [1]	Overall N = 12,686 [1]
race_eth_cat			
Hispanic	1,000 (16%)	1,002 (16%)	2,002 (16%)
Black	1,613 (25%)	1,561 (25%)	3,174 (25%)
Non-Black, Non-Hispanic	3,790 (59%)	3,720 (59%)	7,510 (59%)
region_cat			
Northeast	1,296 (21%)	1,254 (20%)	2,550 (20%)
North Central	1,488 (24%)	1,446 (23%)	2,934 (24%)
South	2,251 (36%)	2,317 (38%)	4,568 (37%)
West	1,253 (20%)	1,142 (19%)	2,395 (19%)
Unknown	115	124	239
eyesight_cat			

[1] n (%); Median (Q1, Q3)

Characteristic	Male N = 6,403[1]	Female N = 6,283[1]	Overall N = 12,686[1]
Excellent	1,582 (38%)	1,334 (31%)	2,916 (35%)
Very good	1,470 (35%)	1,500 (35%)	2,970 (35%)
Good	792 (19%)	1,002 (23%)	1,794 (21%)
Fair	267 (6.4%)	365 (8.5%)	632 (7.5%)
Poor	47 (1.1%)	85 (2.0%)	132 (1.6%)
Unknown	2,245	1,997	4,242
glasses	1,566 (38%)	2,328 (54%)	3,894 (46%)
Unknown	2,241	1,995	4,236
age_bir	25 (21, 29)	22 (19, 27)	23 (20, 28)
Unknown	3,652	3,091	6,743

[1] n (%); Median (Q1, Q3)

I want to report some stats!

The help file for `inline_text()` is helpful and tells us that we can look at `table1$table_body` to help figure out what data to extract.

How about the median (IQR) age of the male participants at the birth of their first child?

```r
1  inline_text(table1, variable = "age_bir", column = "stat_
```

```
[1] "25 (21, 29)"
```

Formatting

We can add sample sizes for the overall stats on people who wear glasses using the `pattern =` argument:

```
1  inline_text(table1, variable = "glasses", column = "stat_
2              pattern = "{n}/{N} ({p}%)")
```

3,894/8450 (46%)

Formatting for regression statistics

Remove some details:

```r
1  inline_text(income_table, variable = "age_bir")
```

```
[1] "595 (95% CI 538, 652; p<0.001)"
```

```r
1  inline_text(income_table, variable = "age_bir",
2              pattern = "{estimate} ({conf.low}, {conf.high}
```

```
[1] "595 (538, 652)"
```

Better yet...

We can integrate these into the text of our manuscript:

```
A greater proportion of female (`r inline_text(table1,
variable = "glasses", column = "stat_2")`) than male

(`r inline_text(table1, variable = "glasses", column =
"stat_1")`) participants wore glasses.
```

Which becomes:

A greater proportion of female (2,328 (54%)) than male (1,566 (38%)) participants wore glasses.

Readability

Because this can be hard to read, I'd suggest storing those
stats in a chunk before the text:

```r
1  ```{r}
2  glasses_f <- inline_text(table1, variable = "glasses",
3                                    column = "stat_2")
4  glasses_m <- inline_text(table1, variable = "glasses",
5                                    column = "stat_1")
6  ```
7  A greater proportion of female (`r glasses_f`) than male
```

Exercises

Return to the quarto document with the tables.

- Choose a table to label and caption, and then write a sentence that *cross-references* it (e.g., Table 1 shows the descriptive statistics)

- Edit or create a new table that has the median hours of sleep on weekends in it (in the overall sample).

- Pull that value from a table.