Figures

```
library(tidyverse)
library(smmr)
```

Figure 1: Packages

```
Force+Height+Species
3.2+5+Hemigrapsus nudus
6.4+6+Hemigrapsus nudus
2+6.4+Hemigrapsus nudus
2+6.5+Hemigrapsus nudus
4.9+6.6+Hemigrapsus nudus
3+7+Hemigrapsus nudus
2.9+7.9+Hemigrapsus nudus
9.5+7.9+Hemigrapsus nudus
4+8+Hemigrapsus nudus
7.4+8.3+Hemigrapsus nudus
2.4+8.8+Hemigrapsus nudus
4+12.1+Hemigrapsus nudus
5.2+12.2+Hemigrapsus nudus
2.1+5.1+Lophopanopeus bellus
8.7+5.9+Lophopanopeus bellus
2.9+6.6+Lophopanopeus bellus
6.9+7.2+Lophopanopeus bellus
8.7+8.6+Lophopanopeus bellus
```

Figure 2: Crab claws data (some)

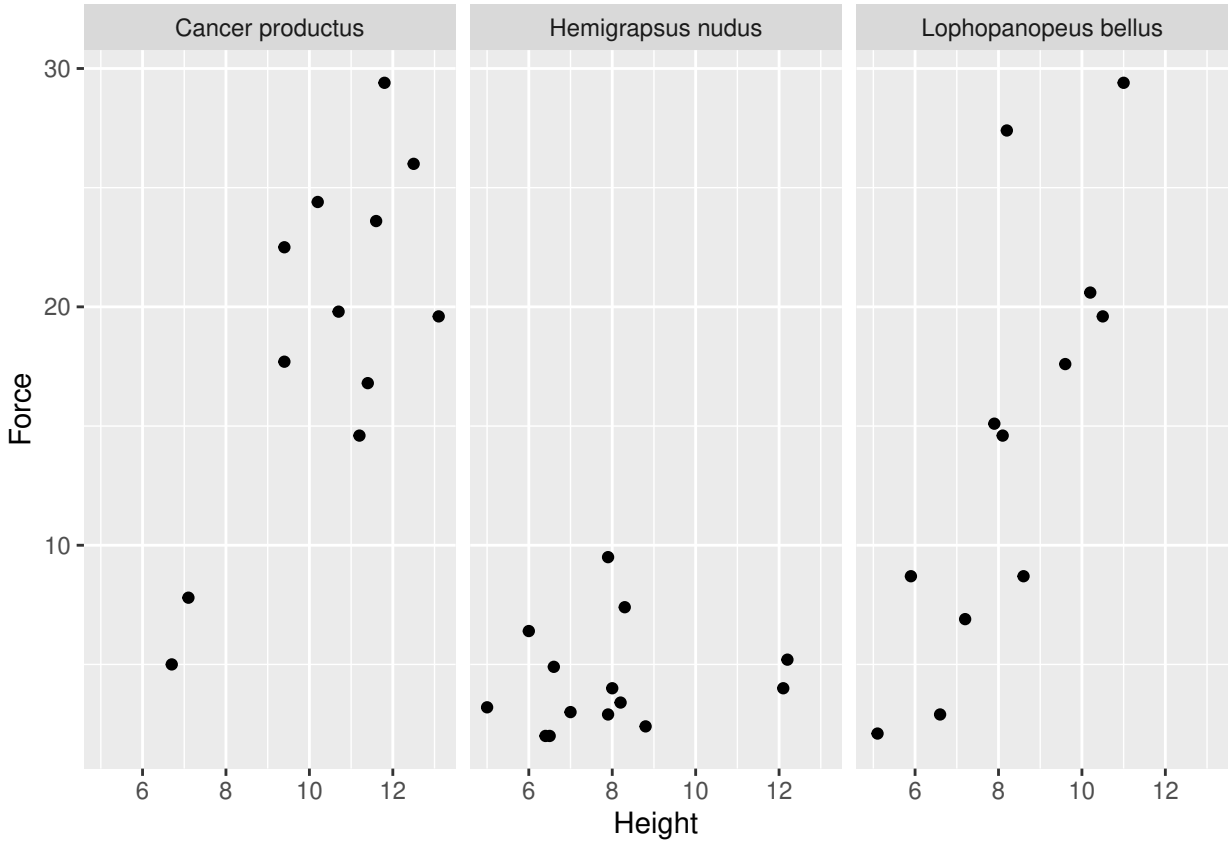

Figure 3: Crab claws graph

```
## # A tibble: 38 x 3
##    Force Height Species
##    <dbl>  <dbl> <chr>
##  1   3.2    5   Hemigrapsus nudus
##  2   6.4    6   Hemigrapsus nudus
##  3   2      6.4 Hemigrapsus nudus
##  4   2      6.5 Hemigrapsus nudus
##  5   4.9    6.6 Hemigrapsus nudus
##  6   3      7   Hemigrapsus nudus
##  7   2.9    7.9 Hemigrapsus nudus
##  8   9.5    7.9 Hemigrapsus nudus
##  9   4      8   Hemigrapsus nudus
## 10   3.4    8.2 Hemigrapsus nudus
## # ... with 28 more rows
```

Figure 4: Crab claws data (some)

```
cereal_sugar
```

```
## # A tibble: 100 x 1
##    sugar
##    <dbl>
##  1  36.3
##  2  33.2
##  3  39
##  4  37.3
##  5  40.7
##  6  38.4
##  7  35.8
##  8  36
##  9  37.9
## 10  42.6
## # ... with 90 more rows
```

Figure 5: Cereal sugar data (some)

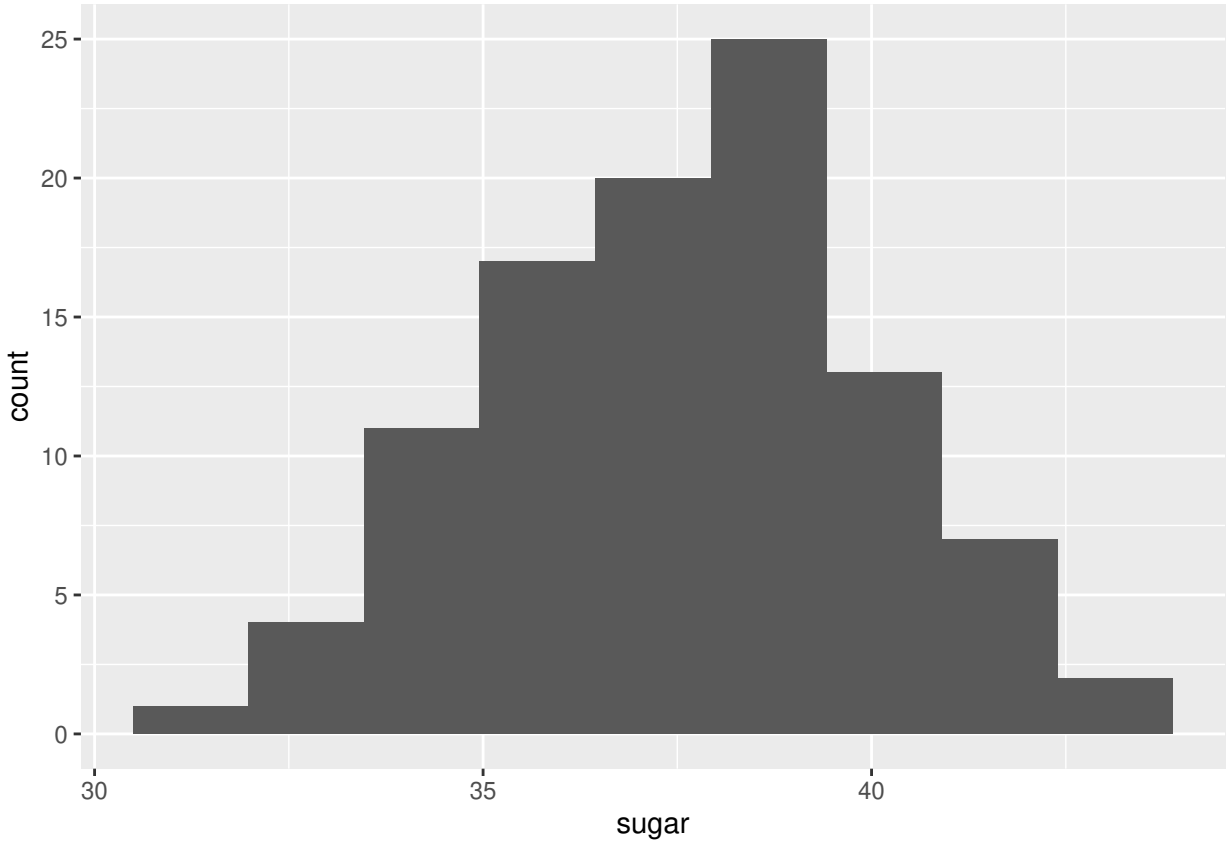

Figure 6: Cereal sugar graph

```
tibble(sim = 1:10000) %>%
  rowwise() %>%
  mutate(my_mean = mean(my_sample)) %>%
  ggplot(aes(x = my_mean)) + geom_histogram(bins = 12)
```

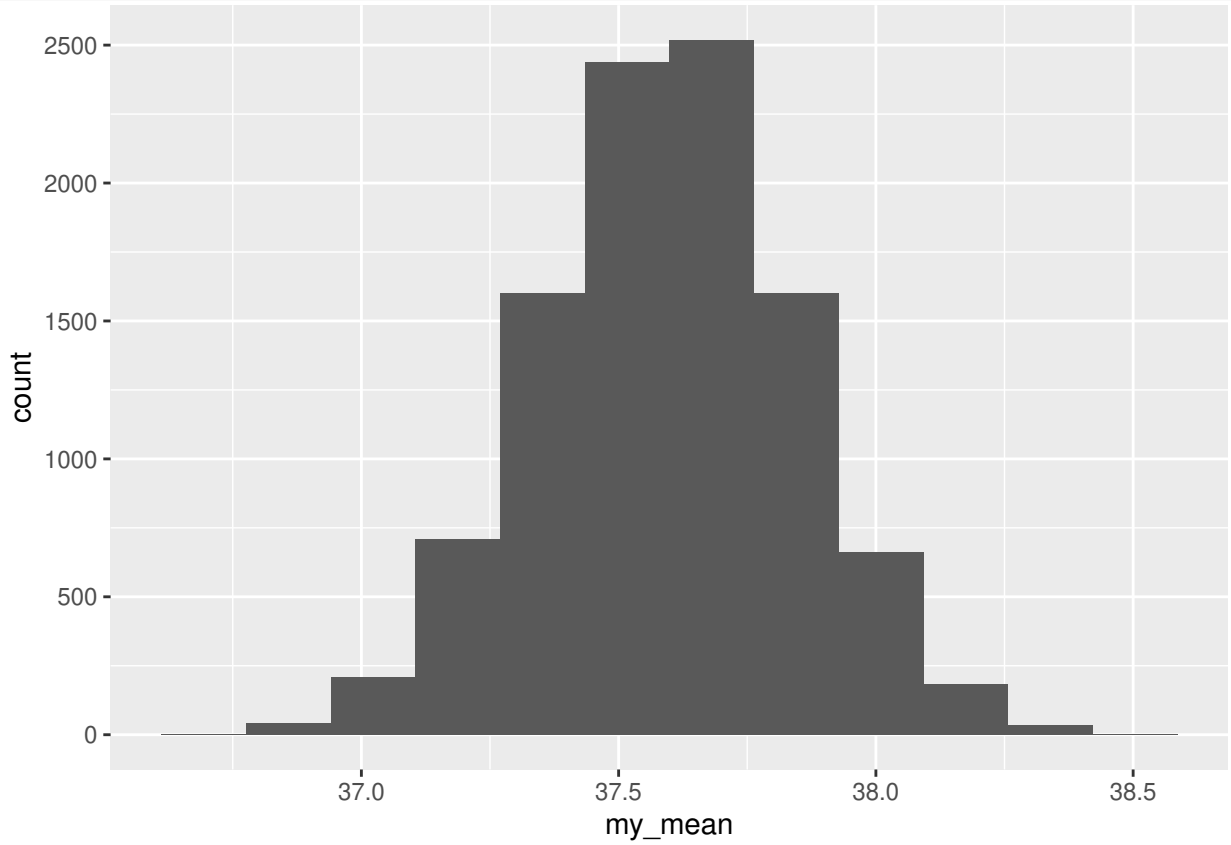

Figure 7: Cereal sugar summary bootstrap sampling distribution of sample mean (one line of code missing)

```
Monoxide
```

```
## # A tibble: 19 x 2
##    company      emission
##    <chr>           <dbl>
##  1 manufacturer      2.7
##  2 manufacturer      3.1
##  3 manufacturer      3.1
##  4 manufacturer      2.9
##  5 manufacturer      2.5
##  6 manufacturer      3.4
##  7 manufacturer      3.4
##  8 manufacturer      3.4
##  9 manufacturer      2.4
## 10 competitor        3.7
## 11 competitor        3
## 12 competitor        3.5
## 13 competitor        3.8
## 14 competitor        2.8
## 15 competitor        3.5
## 16 competitor        3.4
## 17 competitor        3.6
## 18 competitor        2.7
## 19 competitor        3.7
```

Figure 8: Carbon monoxide emissions data

```
t.test(emission ~ company, data = Monoxide, alternative = "greater")
```

```
##
##  Welch Two Sample t-test
##
## data:  emission by company
## t = 2.1187, df = 16.842, p-value = 0.02465
## alternative hypothesis: true difference in means between group competitor and group manufacturer is
## 95 percent confidence interval:
##  0.06802198        Inf
## sample estimates:
##   mean in group competitor mean in group manufacturer
##                   3.370000                   2.988889
```

Figure 9: Carbon monoxide emissions t-test

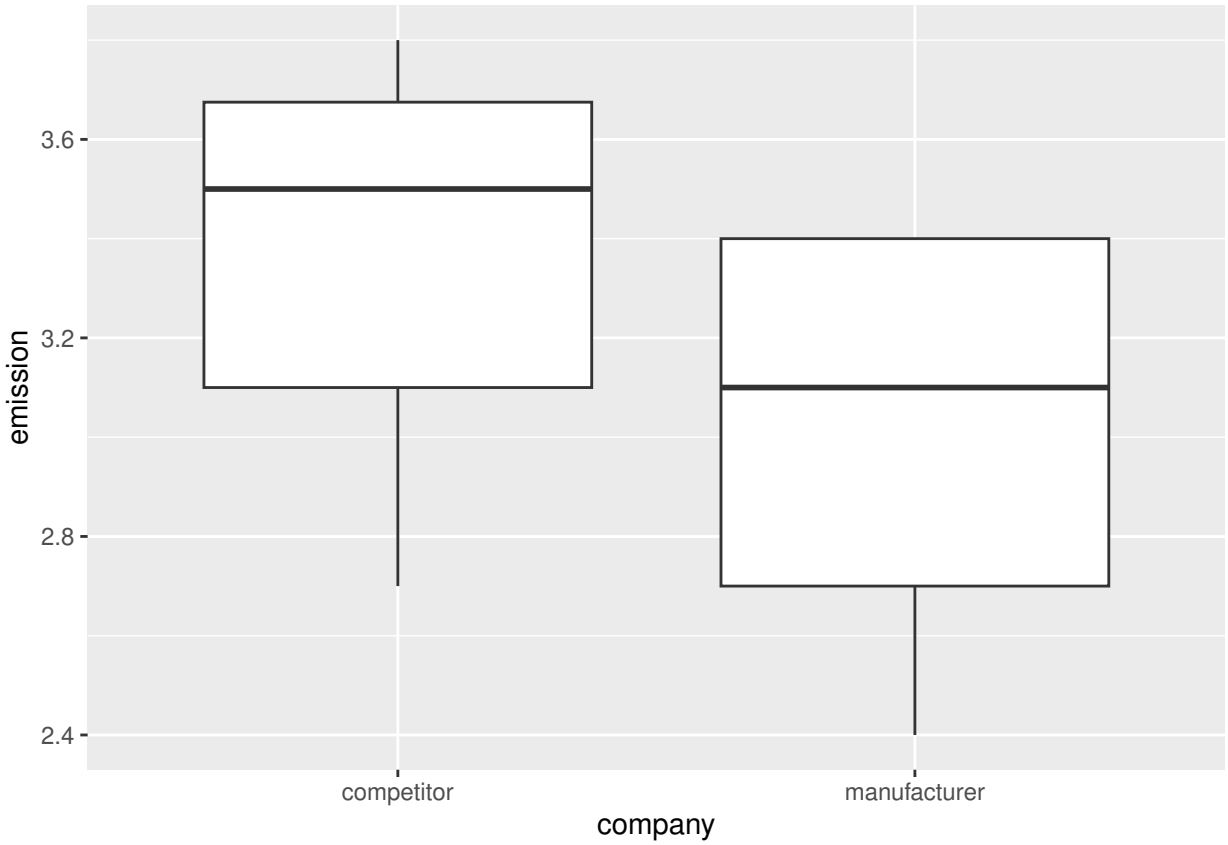

Figure 10: Carbon monoxide emissions graph

```
## # A tibble: 2 x 2
## # Rowwise:
##   `p_value <= 0.05`     n
##   <lgl>             <int>
## 1 FALSE               412
## 2 TRUE                588
```

Figure 11: Beta power simulation results

```
male_heights
```

```
## # A tibble: 100 x 1
##    heights
##      <int>
##  1      71
##  2      67
##  3      69
##  4      70
##  5      68
##  6      63
##  7      68
##  8      72
##  9      70
## 10      70
## # ... with 90 more rows
```

Figure 12: Heights data (some)

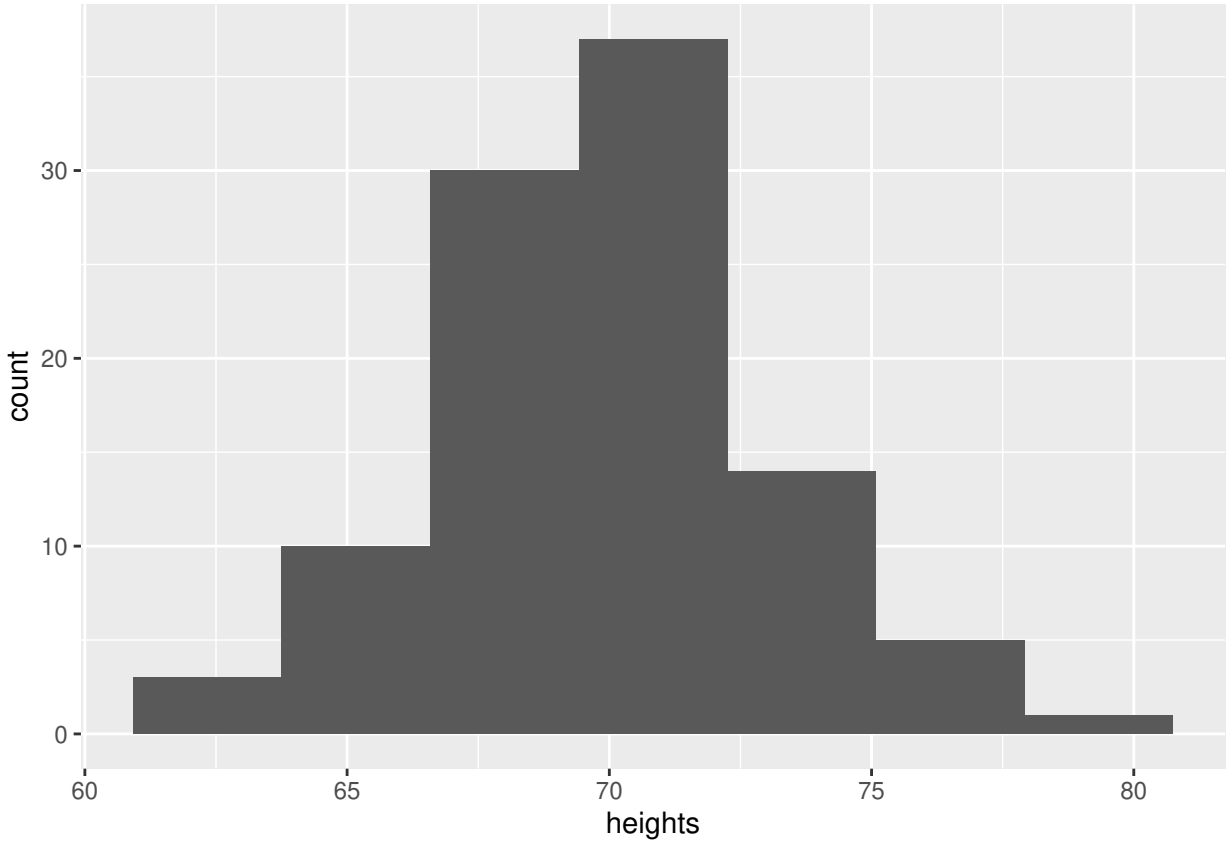

Figure 13: Heights graph

```
## $above_below
## below above
##    68    32
##
## $p_values
##   alternative      p_value
## 1       lower 0.0002043886
## 2       upper 0.9999084284
## 3   two-sided 0.0004087772
```

Figure 14: Heights sign test

```
x <- 20:35
tibble(x, prob = dbinom(x, 100, 0.5)) %>%
  mutate(prob = round(prob, 6))
```

```
## # A tibble: 16 x 2
##        x     prob
##    <int>    <dbl>
##  1    20 0
##  2    21 0
##  3    22 0
##  4    23 0
##  5    24 0
##  6    25 0
##  7    26 0.000001
##  8    27 0.000002
##  9    28 0.000004
## 10    29 0.00001
## 11    30 0.000023
## 12    31 0.000052
## 13    32 0.000113
## 14    33 0.000232
## 15    34 0.000458
## 16    35 0.000864
```

Figure 15: Binomial table for $n = 100, p = 0.5$