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10/17/22

Analysis of Environmental Data

Lab 6

1. rm(list = ls())

sse\_mean = function(x)

{

sd(x, na.rm= TRUE)/sqrt(length(x))

}

sse\_mean(penguins$body\_mass\_g)

sse\_mean(mtcars$mpg)

1. two\_group\_resample\_diff = function(x, n\_1, n\_2)

{

dat\_1 = sample(x, n\_1, replace = TRUE)

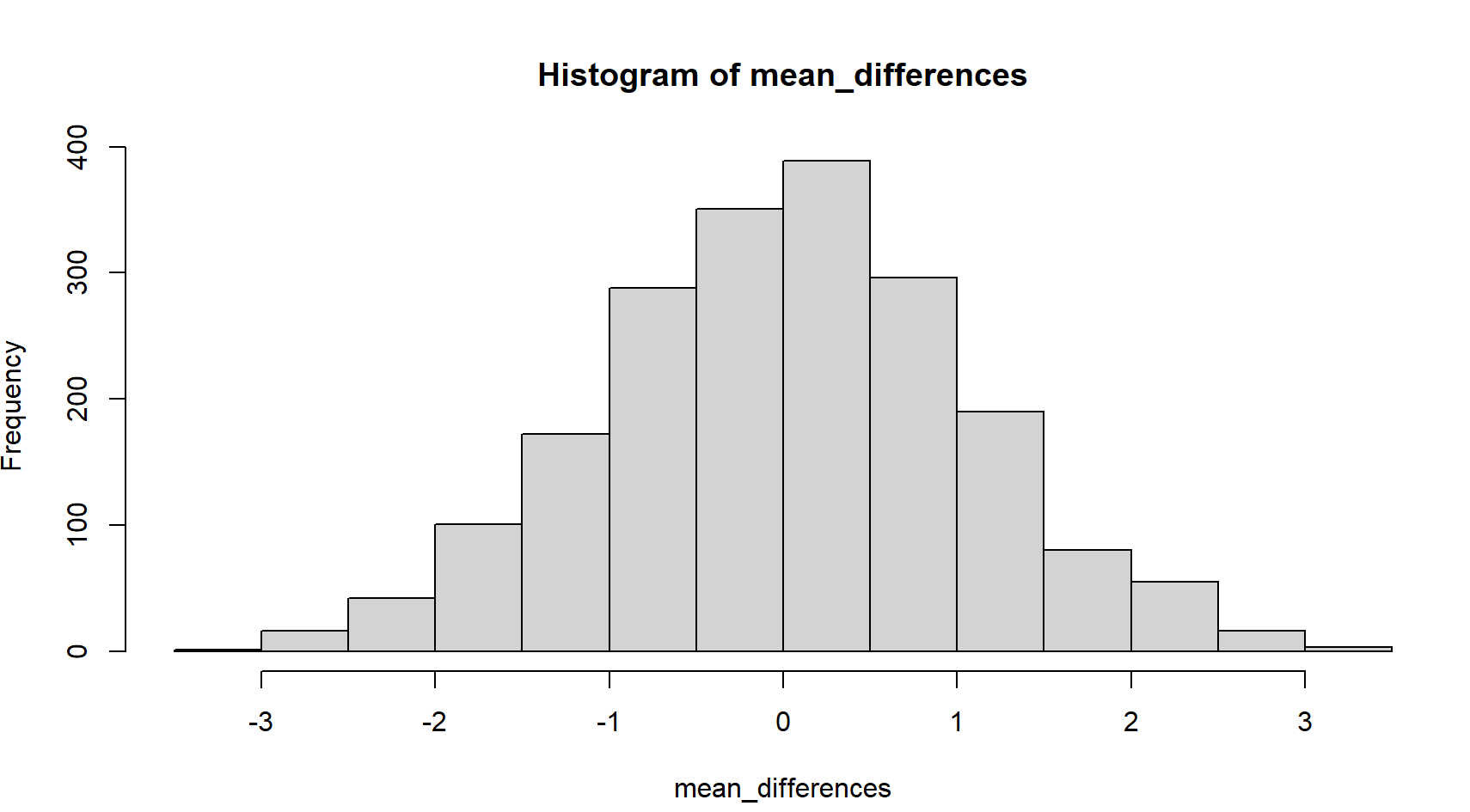
dat\_2 = sample(x, n\_2, replace = TRUE)

difference\_in\_means =

mean(dat\_1, na.rm = TRUE) - mean(dat\_2, na.rm = TRUE)

return(difference\_in\_means)

}

1. MC
2. 
3. n = 2000

mean\_differences = c()

for (i in 1:n)

{

mean\_differences = c(

mean\_differences,

two\_group\_resample\_diff(dat\_pen$flipper\_length\_mm, 68, 152)

)

}

hist(mean\_differences)

sum(abs(mean\_differences)>5.8)

1. Over 10 million
2. Chart, box and whisker chart

   Description automatically generated
3. agg\_means

species bill\_length\_mm

1 Adelie 38.79139

2 Chinstrap 48.83382

diff\_crit

[1] 10.04243

1. p-value < 2.2e-16

The p value is extremely close to zero, meaning the means of the two groups are very different from one another. There is less than one trillionth of one percent of a chance that there is no difference between the means of the two groups.

1. sum(abs(mean\_differences) >= diff\_crit)

[1] 0

1. Chart, histogram

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