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Critical Thinking Assinment 4

Option 2

**# R Hypothesis Tests**

**install.packages("dplyr")**

**tScore\_before <- c(40, 62, 74, 22, 64, 65, 49, 49, 49)**

**tScore\_after <- c(68, 61, 64, 76, 90, 75, 66, 60, 63)**

**# Create a data frame**

**my\_data <- data.frame(**

**group = rep(c("Score Before", "Score After"), each = 9),**

**scores = c(tScore\_before,  tScore\_after)**

**)**

**# Print all data**

**print(my\_data)**

**#Compute summary statistics by groups**

**library(dplyr)**

**group\_by(my\_data, group) %>%**

**summarise(**

**count = n(),**

**mean = mean(scores, na.rm = TRUE),**

**sd = sd(scores, na.rm = TRUE)**

**)**

**# Compute Unpaired Two Sample t-test**

**res <- t.test(tScore\_before, tScore\_after, var.equal = TRUE)**

**res**

**# Compute independent t-test**

**res <- t.test(scores ~ group, data = my\_data, var.equal = TRUE)**

**res**

**#test whether the average score before score is less than the average after score, type this:**

**t.test(scores ~ group, data = my\_data,**

**var.equal = TRUE, alternative = "less")**

**After running the code:**

tScore\_before <- c(40, 62, 74, 22, 64, 65, 49, 49, 49)

>

> tScore\_after <- c(68, 61, 64, 76, 90, 75, 66, 60, 63)

>

> # Create a data frame

>

> my\_data <- data.frame(

+

+ group = rep(c("Score Before", "Score After"), each = 9),

+

+ scores = c(tScore\_before, tScore\_after)

+

+ )

>

>

>

> # Print all data

>

> print(my\_data)

group scores

1 Score Before 40

2 Score Before 62

3 Score Before 74

4 Score Before 22

5 Score Before 64

6 Score Before 65

7 Score Before 49

8 Score Before 49

9 Score Before 49

10 Score After 68

11 Score After 61

12 Score After 64

13 Score After 76

14 Score After 90

15 Score After 75

16 Score After 66

17 Score After 60

18 Score After 63

>

>

>

> #Compute summary statistics by groups

>

> library(dplyr)

>

> group\_by(my\_data, group) %>%

+

+ summarise(

+

+ count = n(),

+

+ mean = mean(scores, na.rm = TRUE),

+

+ sd = sd(scores, na.rm = TRUE)

+

+ )

# A tibble: 2 x 4

group count mean sd

<fct> <int> <dbl> <dbl>

1 Score After 9 69.2 9.63

2 Score Before 9 52.7 15.7

>

>

>

> # Compute Unpaired Two Sample t-test

>

> res <- t.test(tScore\_before, tScore\_after, var.equal = TRUE)

>

> res

Two Sample t-test

data: tScore\_before and tScore\_after

t = -2.7007, df = 16, p-value = 0.01575

alternative hypothesis: true difference in means is not equal to 0

95 percent confidence interval:

-29.550620 -3.560491

sample estimates:

mean of x mean of y

52.66667 69.22222

>

>

>

> # Compute independent t-test

>

> res <- t.test(scores ~ group, data = my\_data, var.equal = TRUE)

>

> res

Two Sample t-test

data: scores by group

t = 2.7007, df = 16, p-value = 0.01575

alternative hypothesis: true difference in means is not equal to 0

95 percent confidence interval:

3.560491 29.550620

sample estimates:

mean in group Score After mean in group Score Before

69.22222 52.66667

> t.test(scores ~ group, data = my\_data,

+

+ var.equal = TRUE, alternative = "less")

Two Sample t-test

data: scores by group

t = 2.7007, df = 16, p-value = 0.9921

alternative hypothesis: true difference in means is less than 0

95 percent confidence interval:

-Inf 27.25786

sample estimates:

mean in group Score After mean in group Score Before

69.22222 52.66667

