Test 8: t-test for Two Population Means (Variances Unknown but Equal))

# Load Required Packages:  
library(package = dplyr)  
library(package = psych)  
  
# Load Required Data:  
data = read.csv(file = "data/Data\_Test\_08.csv", header = TRUE)  
  
# Prepare Data:  
set.seed(5)  
  
sample\_A = data %>% select(Tape\_A) %>%   
 sample\_n(size = 40, replace = FALSE) %>% unlist()  
  
sample\_B = data %>% select(Tape\_B) %>%  
 sample\_n(size = 50, replace = FALSE) %>% unlist()  
  
# Show Data:  
headTail(x = data, top = 2, bottom = 2)

|  |  |  |  |
| --- | --- | --- | --- |
| ## |  | Tape\_A | Tape\_B |
| ## | 1 | 4289 | 2936 |
| ## | 2 | 4398 | 3566 |
|  | … | … | … |
| ## | 999 | 2943 | 3033 |
| ## | 1000 | 1959 | 3666 |

# Assumption Checking:  
# 1. The test is accurate if the populations are normally distributed.  
shapiro.test(x = data$Tape\_A)

## Shapiro-Wilk normality test  
## data: data$Tape\_A  
## W = 0.99854, p-value = 0.5826

shapiro.test(x = data$Tape\_B)

## Shapiro-Wilk normality test  
## data: data$Tape\_B  
## W = 0.99922, p-value = 0.9599

*# use t.test function - alternative = "two.sided":*  
**t.test**(x = sample\_A, y = sample\_B,  
 alternative = "two.sided", conf.level = 0.95, var.equal = TRUE)

## Welch Two Sample t-test:  
## data: sample\_A and sample\_B  
## t = 2.451, df = 88, p-value = 0.016  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## 54.552 552.508  
## sample estimates:  
## mean of x mean of y   
## 3319.35 3030.82