Test 9: t-test for Two Population Means (Variances Unknown And Unequal)

# Load Required Packages:  
library(package = dplyr)  
library(package = psych)  
  
# Load Required Data:  
data = read.csv(file = "data/Data\_Test\_09.csv", header = TRUE)  
  
# Prepare Data:  
set.seed(10)  
  
sample\_Sirvan = data %>% select(Sirvan) %>%   
 sample\_n(size = 55, replace = FALSE) %>% unlist()  
  
sample\_Pishgam = data %>% select(Pishgam) %>%  
 sample\_n(size = 50, replace = FALSE) %>% unlist()  
  
# Show Data:  
headTail(x = data, top = 2, bottom = 2)

## Sirvan Pishgam  
## 1 3821 3257  
## 2 2880 2843  
## ... ... ...  
## 999 3142 3279  
## 1000 3186 4167

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

##   
## Shapiro-Wilk normality test  
##   
## data: data$Sirvan  
## W = 0.99884, p-value = 0.7809

shapiro.test(x = data$Pishgam)

##   
## Shapiro-Wilk normality test  
##   
## data: data$Pishgam  
## W = 0.9988, p-value = 0.7541

# use t.test function - alternative = "two.sided":  
t.test(x = sample\_Sirvan, y = sample\_Pishgam,  
 alternative = "two.sided", conf.level = 0.95, var.equal = FALSE)

##   
## Welch Two Sample t-test  
##   
## data: sample\_Sirvan and sample\_Pishgam  
## t = 1.5648, df = 96.325, p-value = 0.1209  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -73.49724 621.06088  
## sample estimates:  
## mean of x mean of y   
## 3252.982 2979.200