Test 07: t-test for a Population Mean (Variance Unknown)

# Load Required Packages:  
library(package = dplyr)  
library(package = psych)  
library(package = DescTools)  
  
# Load Required Data:  
data <- read.csv(file = "data/Data\_Test\_07.csv", header = TRUE)  
  
# Prepare Data:  
data\_84\_97 <- data %>% filter(Year != "1397-98")  
  
data\_97\_98 <- data %>% filter(Year == "1397-98")  
headTail(x = data\_97\_98, top = 3, bottom = 3)

|  |  |  |  |
| --- | --- | --- | --- |
| ## |  | Year | Razavi\_Khorasan |
| ## | 1 | 1397-98 | 3755 |
| ## | 2 | 1397-98 | 4843 |
| ## | … | … | … |
| ## | 49 | 1397-98 | 2471 |
| ## | 50 | 1397-98 | 2802 |

# Assumption Checking:  
# 1. The test is accurate if the population is normally distributed.  
shapiro.test(data\_84\_97$Razavi\_Khorasan)

## Shapiro-Wilk normality test  
## data: data\_84\_97$Razavi\_Khorasan  
## W = 0.900, p-value = 0.135

# setting initial parameter values:  
mu\_1396\_97 <- data\_84\_97[which(data\_84\_97$Year == "1396-97"), "Razavi\_Khorasan"]  
  
mu\_sample <- mean(x = data\_97\_98$Razavi\_Khorasan)  
sd\_sample <- sd(x = data\_97\_98$Razavi\_Khorasan)  
n\_sample <- nrow(x = data\_97\_98)  
  
# use TTestA function:  
TTestA(mx = mu\_sample, sx = sd\_sample, nx = n\_sample, mu = mu\_1396\_97,  
 alternative = "two.sided", conf.level = 0.95)

## One Sample t-test  
## data: x  
## t = 0.781, df = 49, p-value = 0.439  
## alternative hypothesis: true mean is not equal to 3310  
## 95 percent confidence interval:  
## 3070.684 3853.476  
## sample estimates:  
## mean of x: 3462.08