

# Unit 9 Pre-Class Exercise

Tako Hisada

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You have been assigned to analyze data concerning the disease osteoarthritis and its effect on weight bearing joints such as the knee. You are given the following summary data on the stance duration from two groups; older, and younger adults. With this data perform a one sided hypothesis test at  $\alpha = 0.05$  on whether the mean standing duration is longer in older individuals. Assume stance duration in both populations is normally distributed.

Group	Sample Size	Sample Mean	Sample Std Dev
Older	28	801	117
Younger	16	780	72

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# Initialize variables with the values from the table
alpha = 0.05
s1 = 117
s2 = 72
mu1 = 801
mu2 = 780
n1 = 28
n2 = 16

computeV <- function(s1, s2, n1, n2) {
  floor((s1^2/n1 + s2^2/n2)^2/((s1^2/n1)^2/(n1-1) + (s2^2/n2)^2/(n2-1)))
}

v = computeV(s1, s2, n1, n2)

computeT <- function(mu1, mu2, s1, s2, n1, n2) {
  (mu1 - mu2)/sqrt(s1^2/n1 + s2^2/n2)
}

T = computeT(mu1, mu2, s1, s2, n1, n2)
pval = pt(T,v,lower.tail = FALSE)

# If the P value is smaller than alpha, reject Null
if (pval <= alpha)
  { "Reject Null" }

# Otherwise we fail to reject Null
if (pval > alpha)
  { "Fail to Reject Null" }

## [1] "Fail to Reject Null"
```