Week 9 Preclass Exercise

Shan He

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

```
#sample statistics
s1 <- 117
s2 <- 72
mu1 <- 801
mu2 <- 780
n1 <- 28
n2 <- 16

#sample standard errors
se1 <-s1/sqrt(n1)
se2 <- s2/sqrt(n2)

#degree of freedom
v <- (se1^2 + se2^2)^2 / ( (se1)^4/(n1-1) + (se2)^4/(n2-1) )

#t-statistics
t = (mu1 - mu2)/sqrt(se1^2 + se2^2)

#p-value
p = pt(t, v, lower.tail = FALSE)

#t-test result
alpha = 0.05

if (p <= alpha)
{ "Reject Null" }

if (p > alpha)
{ "Fail to Reject Null" }
```

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