

## MAT1011 (Applied Statistics) Lab

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### Question & R-code :

Test whether the volume of a shipment of lumber is less than usual( $\mu_0=39000$  cubic feet)

```
R Console

> #Khan Mohd. Owais Raza__20BCD7138#
> #Applied Statistics_MAT1011#
> # Question-1 #
> #t-Test#
>
> set.seed(0)
> treeVolume <- c(rnorm(75, mean = 36500, sd = 2000))
> t.test(treeVolume, mu = 39000)

One Sample t-test

data: treeVolume
t = -12.288, df = 74, p-value < 2.2e-16
alternative hypothesis: true mean is not equal to 39000
95 percent confidence interval:
 36033.60 36861.38
sample estimates:
mean of x
 36447.49
```

### Question & R-code :

Let's say that we work at a large health clinic and we're testing a new drug, Procardia, that's meant to reduce hypertension. We find 1000 individuals with a high systolic blood pressure ( $\bar{x} = 145$  mmHg,  $SD = 9$  mmHg), we give them Procardia for a month, and then measure their blood pressure again. We find that the mean systolic blood pressure has decreased to 138 mmHg with a standard deviation 8 mmHg.

R Console

```
> #Khan Mohd. Owais Raza__20BCD7138#
> #Applied Statistics_MAT1011#
> # Question-2 #
> #t-Test#
> set.seed(2820)
>
> preTreat <- c(rnorm(1000, mean = 145, sd = 9))
> postTreat <- c(rnorm(1000, mean = 138, sd = 8))
>
> t.test(preTreat, postTreat, paired = TRUE)

      Paired t-test

data:  preTreat and postTreat
t = 19.751, df = 999, p-value < 2.2e-16
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 6.703959 8.183011
sample estimates:
mean of the differences
              7.443485
```

### Question & R-code :

We have the potato yield from 12 different farms. We know that the standard potato yield for the given variety is  $\mu=20$ .

$x = [21.5, 24.5, 18.5, 17.2, 14.5, 23.2, 22.1, 20.5, 19.4, 18.1, 24.1, 18.5]$

```
> #Khan Mohd. Owais Raza__20BCD7138#  
> #Applied Statistics_MAT1011#  
> # Question-3 #  
> #t-Test#  
>  
> x=c(21.5,24.5,18.5,17.2,14.5,23.2,22.1,20.5,19.4,18.1,24.1,18.5)  
> t.test(x,mu=20)
```

One Sample t-test

```
data: x  
t = 0.20066, df = 11, p-value = 0.8446  
alternative hypothesis: true mean is not equal to 20  
95 percent confidence interval:  
 18.25544 22.09456  
sample estimates:  
mean of x  
 20.175
```