

ASSIGNMENT 12

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SUBJECT: MAT1011 L4

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SLOT : L4

1.Two different computer processors are compared by measuring the processing speed for different operations performed by computers using the two processors. If 12 measurements with the first processor had a standard deviation of 0.1 GHz and 16 measurements with the second processor had a standard deviation of 0.15 GHz, can it be concluded that the processing speed of the second processor is less uniform? Use a 0.05 level of significance. What assumptions must be made as to how the two samples are obtained?

```
s1=0.1
> s2=0.15
> n1=12
> n1=n1-1
> n2=16-1
> m=(s2/s1)^2
> pf(m,n2,n1,lower.tail=FALSE)
[1] 0.08972093
```

P Value>0.05 hence hypothesis is True.

2.Scientists need to be able to detect small amounts of contaminants in the environment. As a check on current capabilities, measurements of lead content (ug/L) are taken from twelve water specimens spiked with a known concentration. 2.4 2.9 2.7 2.6 2.9 2.0 2.8 2.2 2.4 2.4 2.0 2.5

```
t.test(x, mu = 2.25, alternative = "greater")
```

One Sample t-test

```
data: x
t = 2.5836, df = 11, p-value = 0.01271
alternative hypothesis: true mean is greater than 2.25
95 percent confidence interval:
 2.32114      Inf
sample estimates:
mean of x
 2.483333
```

P Value(0.01271)<0.025 Hence null hypothesis is false.

3. A random sample of 6 steel beams has a mean compressive strength of 58,392 psi (pounds per square inch) with a standard deviation of 648 psi. Use this information and the level of significance $\alpha = 0.05$ to test whether the true average compressive strength of the steel from which this sample came is 58,000 psi. Assume normality.

```
t.test(x,mu=58000)
```

One Sample t-test

```
data: x
t = 1.6614, df = 5, p-value = 0.1575
alternative hypothesis: true mean is not equal to 58000
95 percent confidence interval:
 57773.84 59052.71
sample estimates:
mean of x
 58413.27
```

P Value > 0.05 hence null hypothesis is true.