

ACADGILD ASSIGNMENT 9.2

SESSION 9: Statistical Inference

1. Calculate the p-value for the test in Problem no 2.

Answer:

```
t.test(mtcars$am, mu=10, conf.level=0.99)
```

```
t.test(mpg ~ am, data=mtcars)
```

Output from R-console

```
> t.test(mtcars$am, mu=10, conf.level=0.99)
```

One Sample t-test

```
data:  mtcars$am
t = -108.76, df = 31, p-value < 2.2e-16
alternative hypothesis: true mean is not equal to 10
99 percent confidence interval:
 0.1641982 0.6483018
sample estimates:
mean of x
 0.40625
```

```
> t.test(mpg ~ am, data=mtcars)
```

welch Two Sample t-test

```
data:  mpg by am
t = -3.7671, df = 18.332, p-value = 0.001374
alternative hypothesis: true difference in means is not
equal to 0
95 percent confidence interval:
 -11.280194 -3.209684
sample estimates:
mean in group 0 mean in group 1
 17.14737      24.39231
```

2. How do you test the proportions and compare against hypothetical props? Test hypothesis: proportion of automatic cars is 40%

Answer:

```
prop.test(table(mtcars$am)[2],nrow(mtcars),p=0.4,alternative =  
"less",conf.level = 0.99,correct = FALSE)
```

```
prop.test(table(mtcars$mpg)[2],nrow(mtcars),p=0.4,alternative =  
"less",conf.level = 0.99,correct = FALSE)
```

```
prop.test(table(mtcars$cyl)[2],nrow(mtcars),p=0.4,alternative =  
"less",conf.level = 0.99,correct = FALSE)
```

```
prop.test(table(mtcars$wt)[2],nrow(mtcars),p=0.4,alternative =  
"less",conf.level = 0.99,correct = FALSE)
```

Output from R-console

1-sample proportions test without continuity correction

```
data:  table(mtcars$wt)[2] out of nrow(mtcars), null  
probability 0.4
```

```
X-squared = 18.13, df = 1, p-value = 1.032e-05
```

```
alternative hypothesis: true p is less than 0.4
```

```
99 percent confidence interval:
```

```
0.000000 0.193806
```

```
sample estimates:
```

```
      p  
0.03125
```

```
>
```

```
prop.test(table(mtcars$am)[2],nrow(mtcars),p=0.4,altern  
ative = "less",conf.level = 0.99,correct = FALSE)
```

1-sample proportions test without continuity
correction

```
data: table(mtcars$am)[2] out of nrow(mtcars), null
probability 0.4
X-squared = 0.0052083, df = 1, p-value = 0.5288
alternative hypothesis: true p is less than 0.4
99 percent confidence interval:
 0.0000000 0.6070996
sample estimates:
      p
0.40625
>
prop.test(table(mtcars$mpg)[2],nrow(mtcars),p=0.4,alter
native = "less",conf.level = 0.99,correct = FALSE)
```

1-sample proportions test without continuity correction

```
data: table(mtcars$mpg)[2] out of nrow(mtcars), null
probability 0.4
X-squared = 18.13, df = 1, p-value = 1.032e-05
alternative hypothesis: true p is less than 0.4
99 percent confidence interval:
 0.0000000 0.193806
sample estimates:
      p
0.03125
```