Week13InClassLecture

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```
library(stats)
library(readxl)
```

$H_0 : P = 0.2$ vs $H_a : P > 0.2$

```
prop.test(310,1000,p=0.2,alternative = "greater")
```

```
##
##  1-sample proportions test with continuity correction
##
## data:  310 out of 1000, null probability 0.2
## X-squared = 74.939, df = 1, p-value < 2.2e-16
## alternative hypothesis: true p is greater than 0.2
## 95 percent confidence interval:
##  0.2859952 1.0000000
## sample estimates:
##    p
## 0.31
```

the p-value < 2.2e-16, which is extremely low. Therefore, we should reject the H_0 and go with H_a.

$H_0 : P = 0.5$ vs $Ha : P > 0.5$ write doen the null and alternative. after the R chunk, write down the conclusion.

```
prop.test(8,8,0.5,alternative = "greater")
```

```
## Warning in prop.test(8, 8, 0.5, alternative = "greater"): Chi-squared
## approximation may be incorrect
```

```
##
##  1-sample proportions test with continuity correction
##
## data:  8 out of 8, null probability 0.5
## X-squared = 6.125, df = 1, p-value = 0.006664
## alternative hypothesis: true p is greater than 0.5
## 95 percent confidence interval:
##  0.6625163 1.0000000
## sample estimates:
## p
## 1
```

the p-value = 0.006664. If the significance level is < 0.001, then we reject the p-value.

$H_0 : P = 0.75$ vs $H_a : P > 0.75$

```
# how manuy people can roll their tongues?
prop.test(14,16,0.75,alternative = "greater")
```

```
## Warning in prop.test(14, 16, 0.75, alternative = "greater"): Chi-squared
## approximation may be incorrect
```

```
##
##  1-sample proportions test with continuity correction
##
## data:  14 out of 16, null probability 0.75
## X-squared = 0.75, df = 1, p-value = 0.1932
## alternative hypothesis: true p is greater than 0.75
## 95 percent confidence interval:
##  0.6472633 1.0000000
## sample estimates:
##     p
## 0.875
```

p-value=0.1932>0.05 We fail to reject the H_0. At 5% significance level data do not provide enough evidence to conclude proportion of students who can roll their tongue is greater than 75%

p:Proportion of drivers who feels comfortable driving self driving car $H_0 : P = 0.5$ vs $H_a : P < 0.5$

```
selfDriving <- read_excel("~/Desktop/Data211/Week 13/Responses_to_Self-driving_Cars.xlsx")
selfDriving
```

```
## # A tibble: 5,980 x 5
##    Comfortable When  Crashes       Sex      Age
##    <chr>       <chr> <chr>         <chr>  <dbl>
##  1 Yes         10    Decrease      Male      30
##  2 Yes         10    Decrease      Male      48
##  3 No          50    Stay the same Female    27
##  4 No          5     Stay the same Male      19
##  5 Yes         10    Decrease      Male      21
##  6 Yes         5     Stay the same Female    20
##  7 No          50    Increase      Male      65
##  8 Yes         15    Decrease      Female    21
##  9 Yes         7     Decrease      Male      18
## 10 Yes         10    Decrease      Male      61
## # i 5,970 more rows
```

```
table(selfDriving$Comfortable)
```

```
##
##   No  Yes
## 3102 2860
```

```r
length(selfDriving$Comfortable)#this will include NAs
```

```
## [1] 5980
```

```r
prop.test(2860,5962,0.5,alternative = "less")
```

```
##
##  1-sample proportions test with continuity correction
##
## data:  2860 out of 5962, null probability 0.5
## X-squared = 9.7419, df = 1, p-value = 0.0009006
## alternative hypothesis: true p is less than 0.5
## 95 percent confidence interval:
##  0.000000 0.490438
## sample estimates:
##         p
## 0.4797048
```

p-value = 0.000906 < 0.01 We reject H_0 at 1% significance level At 1% s.l, we have enough evidence to conclude that the P<50%

```r
prop.test(x=c(51,19),n=c(303,303),alternative = "greater")
```

```
##
##  2-sample test for equality of proportions with continuity correction
##
## data:  c(51, 19) out of c(303, 303)
## X-squared = 15.521, df = 1, p-value = 4.079e-05
## alternative hypothesis: greater
## 95 percent confidence interval:
##  0.06018222 1.00000000
## sample estimates:
##     prop 1     prop 2
## 0.16831683 0.06270627
```

p=4.079e-05<0.01

Reject the H_0. At 1% s.l we have enough evidence to conclude that the proportion of voters who favor in YS is significantly higher than those who favor on Yo.