Topic 24 Demo

We have two populations, W={all WCC students enrolled in credit classes Winter term 2020} and S={all Schoolcraft students enrolled in credit classes Winter term 2020}. There are many ways to classify community college students. One way would be to look at the number of credits the student are taking. We believe that the proportion of students taking 15 or more credits in Winter 2020 is the same at WCC and at Schoolcraft. We can test this hypothesis, at the 0.05 level of significance against the alternative that the proportions are not the same. We can take random samples of WCC students and of Schoolcraft students enrolled in Winter 2020 credit classes. The following table summarizes the result of taking those samples:

	Number in the sample	Number taking 15 or more credits
WCC students	265	60
Schoolcraft Students	321	96

What is the result of testing that hypothesis against the alternative Hypothesis?

Edit or

topic 24 demo.R

```
#This is a model for topic 24

#  we will use the hypoth_2poppproport() function
source("../hypo_2poppproport.R")
hypoth_2test_prop( 60, 265, 96, 321, 0, 0.05)
```

Console Terminal Jobs

```
> #  we will use the hypoth_2poppproport() function
> source("../hypo_2poppproport.R")
> hypoth_2test_prop( 60, 265, 96, 321, 0, 0.05)
                  H1:                 n_one                 x_one
        "p_1 != p_2"                 "265"                  "60"
           phat_one                 n_two                 x_two
"0.226415094339623"                 "321"                  "96"
           phat_two                pooled               Std Err
"0.299065420560748"  "0.266211604095563"  "0.0366836267388016"
         z extreme         critical low        critical high
 "1.95996398454005" "-0.0718985872303615"  "0.0718985872303615"
          difference              attained              decision
"-0.072650326221125"  "0.0476522590913993"              "Reject"
```

Edit or

```
#  On the other hand, we might just want to get a 95%
#  confidence interval for the difference of the
#  proportion of "full time" students at WCC versus
#  the proportion at Schoolcraft.   To do this we
#  use the ci_2poppproportion()
#
source("../ci_2poppproport.R")
ci_2poppproportion( 265, 60, 321, 96, 0.95)
```

```
> #  On the other hand, we might just want to get a 95%
> #  confidence interval for the difference of the
> #  proportion of "full time" students at WCC versus
> #  the proportion at Schoolcraft.   To do this we
> #  use the ci_2poppproportion()
> #
> source("../ci_2poppproport.R")
> ci_2poppproportion( 265, 60, 321, 96, 0.95)
      ci low      ci_high       M of E      Std. Err      z-value
-0.143696969 -0.001603684  0.071046643  0.036248953  1.959963985
     alpha/2      p hat 1      p hat 2
 0.025000000  0.226415094  0.299065421
```

$$\hat{p}_1 = \frac{x_1}{n_1} \qquad \hat{p}_2 = \frac{x_2}{n_2} \qquad std\ \ err = \sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1} + \frac{\hat{p}_2(1-\hat{p}_2)}{n_2}}$$