

R Package Week4 Vignette

```
library(week4)
```

The Week4 package is a R package that serves as an exercise for my summer 2021's PURM project. It contains two functions and one dataset. I have also developed a shiny app that does the same thing, which can be accessed through https://sheepywool.shinyapps.io/Task_Week_2/.

The first of the two functions in the package is `prop_test()`, which returns the p-value at 95% confidence level from a two sample proportion test. It takes in four parameters, number of success and sample size of sample 1, and the same for sample 2. An example is shown below.

```
prop_test(50, 100, 30, 100)
#> [1] 0.006098946
```

This function is much better when used on a dataset. This package incorporated a sample dataset containing two samples x and y. Each sample has 100 entries, with sample x having a 30% success rate and sample y having a 70% success rate.

```
head(binom_sample)
#>   x y
#> 1 0 1
#> 2 0 1
#> 3 0 1
#> 4 1 0
#> 5 0 1
#> 6 1 1
```

We can thus carry out a two sample proportion test on this dataset. For other dataframes, users can set an artificial threshold to determine the number of success and thus carry out the test.

```
success_x = sum(binom_sample['x'])
success_y = sum(binom_sample['y'])
sample_size = nrow(binom_sample)

prop_test(success_x, sample_size, success_y, sample_size)
#> [1] 1.662067e-07
```

The second function in the package is `prop_nfind()`. This function serves as a sample size calculator, calculating the sample size needed to result in significance. This function uses the equation from <http://powerandsamplesize.com/Calculators/Compare-2-Proportions/2-Sample-Equality>. It takes the success rate for both samples, the desired significance level, power, and finally the ratio between the sample size. An example is shown below.

```
prop_nfind(0.3, 0.5, 0.05, 0.8, 1.5)
#> [1] 116 77
```