```
R version 4.0.2 (2020-06-22) -- "Taking Off Again"
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Platform: x86_64-w64-mingw32/x64 (64-bit)

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  Natural language support but running in an English locale

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[Previously saved workspace restored]

> #Experiment 10
>  #Date 1-12-2020
>  #Slot lab L1
>  #Title Test on Single Proportion
>  #Name Amlan Nayak
>  #Reg No. 19BCD7143
>  ##Course Applied statistics
>  #Code MAT1011
>  #Suppose 60% of citizens voted in last election
>  #In a telephonic survey,they said that 85 out of  #148 people voted in current election
>  #At 5% level of significance, can we reject the null  #hypothesis that the proportion of vo
ters in
>  #the population is above 60% this year.
>  #Null hypothesis H0:p0.6
>  #Alternate hypothesis H1:p<=0.6
>  #Left tailed test
>  pbar=85/148
>  pbar
[1] 0.5743243
> [1] 0.5743243
Error: unexpected '[' in "["
>  p0=0.6
>  q0=1-p0
>  q0
[1] 0.4
> [1] 0.4
Error: unexpected '[' in "["
>  n=148
>  z=(pbar-p0)/(sqrt((p0*q0)/n))
>  z
[1] -0.6375983
> [1] -0.6375983
Error: unexpected '[' in "["
>  # z0 is negative and left tailed test
>  #Pvalue=P(Z<=z0)
>  Pvalue=pnorm(z)
>  Pvalue
[1] 0.2618676
> [1] 0.2618676
Error: unexpected '[' in "["
>  #Rejected area=significance level=0.05=alpha
>  #Pvalue is much greater than alpha
>  #Accept null hypothesis
>  #Suppose that 12% of apples harvested in an orchard  #last year.30 out of 214 apples in a h
arvest sample  #this year turns to be rotten. At 5% level of significance  #can we reject null
 hypothesis that the proportion  #of rotten apples in harvest stays below 12% this year.  #Nul
l hypothesis H0:p<0.12
>  #Alternate hypotheiss H1:p=0.12 Right tailed test  pbar=30/214
>  pbar
[1] 0.5743243
> [1] 0.1401869
Error: unexpected '[' in "["
>  p0=0.12
```

```
>  q0=1-p0
>  q0
[1] 0.88
> [1] 0.88
Error: unexpected '[' in "["
>  z=(pbar-p0)/(sqrt((p0*q0)/214))
>  z
[1] 20.45224
> R Console Page 2
Error: unexpected symbol in "R Console"
> [1] 0.908751
Error: unexpected '[' in "["
>  #positive and Right tailed test Pvalue=P(Z=z0)=1-P(Z<=z0)  Pvalue=1-pnorm(z)
>  Pvalue
[1] 0.2618676
> [1] 0.1817408
Error: unexpected '[' in "["
>  #Alpha=0.05
>  #pvaluealpha Accept H0.
>  #Two tailed test problem
>  #Suppose a coin toss turns up 12 heads out of
>  #20 trials. At 5% level of significance, can we
>  #reject Null hypothesis the coin toss is fair
>  #Null hypothesis H0: p=0.5
>  #Alternate hypothesis H1:p not equal to 0.5
>  pbar=12/20
>  pbar
[1] 0.6
> [1] 0.6
Error: unexpected '[' in "["
>  p0=0.5
>  q0=1-p0
>  q0
[1] 0.5
> [1] 0.5
Error: unexpected '[' in "["
>  z=(pbar-p0)/(sqrt((p0*q0)/20))
>  z
[1] 0.8944272
> [1] 0.8944272
Error: unexpected '[' in "["
>  #Since it is a two tailed test
>  # and z0 is positive ,Pvalue is 2*P(Z=z0)
>  #Pvalue=2*(1-P(Z<=z0))
>  Pvalue=2*(1-pnorm(z))
>  Pvalue
[1] 0.3710934
> [1] 0.3710934
Error: unexpected '[' in "["
>  alpha=0.05
>  #Pvaluealpha
>  #Accept hypothesis
>  #Accept Null Hypothesis H0.
> #Assignment problem
> #z for the data set specified in a, with a mean equal to 13
> # and a variance equal to 16.
> a <- c(10, 8, 7, 12, 9, 6, 7, 8)
> mu <- 13
> var <- 16
> z.test = function(a, mu, var){
+    zeta = (mean(a) - mu) / (sqrt(var / length(a)))
+    return(zeta)
+ }
> z.test(a, mu, var)
[1] -3.270369
> #Group A with an early morning class of 400 students with 342 female students.
> #Group B with a late class of 400 students with 290 female students.
> #Use a 5% alpha level. We want to know, whether the proportions
> #of females are the same in the two groups of the student?
> prop.test(x = c(342, 290),
+           n = c(400, 400))

        2-sample test for equality of proportions with continuity correction
```

```
data:  c(342, 290) out of c(400, 400)
X-squared = 19.598, df = 1, p-value = 9.559e-06
alternative hypothesis: two.sided
95 percent confidence interval:
 0.07177443 0.18822557
sample estimates:
prop 1 prop 2
 0.855  0.725

> prop.test(x = c(342, 290),
+           n = c(400, 400),
+           alternative = "less")

        2-sample test for equality of proportions with continuity correction

data:  c(342, 290) out of c(400, 400)
X-squared = 19.598, df = 1, p-value = 1
alternative hypothesis: less
95 percent confidence interval:
 -1.0000000  0.1792664
sample estimates:
prop 1 prop 2
 0.855  0.725

> prop.test(x = c(342, 290),
+           n = c(400, 400),
+           alternative = "greater")

        2-sample test for equality of proportions with continuity correction

data:  c(342, 290) out of c(400, 400)
X-squared = 19.598, df = 1, p-value = 4.779e-06
alternative hypothesis: greater
95 percent confidence interval:
 0.08073363 1.00000000
sample estimates:
prop 1 prop 2
 0.855  0.725

>
```