PMDS503P – Statistical Inference LAB
NAME : Anish Kumar Barik
Redg NO. : 24MDT0170
LAB ASSIGNMENT NO.2
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```r
library(BSDA)
```

```
## Warning:  package 'BSDA' was built under R version 4.4.2
## Loading required package:  lattice
##
## Attaching package:  'BSDA'
## The following object is masked from 'package:datasets':
##
##     Orange
```

```r
#Question 1.
#H0: mu0=14
#H1: mu0<14
zsum.test(mean.x = 13.5,sigma.x = 3,n.x=60,alternative = "less",mu = 0,conf.level = 0.95)
```

```
##
##  One-sample z-Test
##
## data:  Summarized x
## z = 34.857, p-value = 1
## alternative hypothesis: true mean is less than 0
## 95 percent confidence interval:
##        NA 14.13705
## sample estimates:
## mean of x
##      13.5
```

```r
#p-values<0.5=>Reject H0

zsum.test(mean.x = 13.5,sigma.x = 3,n.x=60,alternative = "less",mu = 0,conf.level = 0.99)
```

```
##
##  One-sample z-Test
##
## data:  Summarized x
## z = 34.857, p-value = 1
## alternative hypothesis: true mean is less than 0
## 99 percent confidence interval:
##        NA 14.40099
## sample estimates:
## mean of x
##      13.5
```

```r
#p-values<0.1=>Reject H0
```

```r
#Question 2.
#H0 : mu1=mu2
#H1 : mu1<mu2
zsum.test(mean.x =63.5 ,sigma.x = 5.4,n.x = 45,mean.y = 66.2,sigma.y = 5.8,n.y = 60,alternat

##
##  Two-sample z-Test
##
## data:  Summarized x and y
## z = -2.4559, p-value = 0.007027
## alternative hypothesis: true difference in means is less than 0
## 95 percent confidence interval:
##          NA -0.8916582
## sample estimates:
## mean of x mean of y
##      63.5      66.2

#p-values<0.5=>Reject H0
#alpha = 0.01
zsum.test(mean.x =63.5 ,sigma.x = 5.4,n.x = 45,mean.y = 66.2,sigma.y = 5.8,n.y = 60,alternat

##
##  Two-sample z-Test
##
## data:  Summarized x and y
## z = -2.4559, p-value = 0.007027
## alternative hypothesis: true difference in means is less than 0
## 99 percent confidence interval:
##          NA -0.1424276
## sample estimates:
## mean of x mean of y
##      63.5      66.2

#p-values<0.1=>Reject H0
#alpha = 0.05
```

```r
#Question 3.
#H0: P1 = P2
#H1: P1! = P2
x<-c(100,55)
n<-c(190,65)
prop.test(x,n,alternative = "two.sided",conf.level = 0.95,correct = FALSE)
```

```
##
##  2-sample test for equality of proportions without continuity correction
##
## data:  x out of n
## X-squared = 20.784, df = 1, p-value = 5.14e-06
## alternative hypothesis: two.sided
## 95 percent confidence interval:
##  -0.4326829 -0.2069932
## sample estimates:
##    prop 1    prop 2
## 0.5263158 0.8461538

#p-values>=0.5=>Reject H0
#alpha = 0.01
prop.test(x,n,alternative = "two.sided",conf.level = 0.99,correct = FALSE)

##
##  2-sample test for equality of proportions without continuity correction
##
## data:  x out of n
## X-squared = 20.784, df = 1, p-value = 5.14e-06
## alternative hypothesis: two.sided
## 99 percent confidence interval:
##  -0.4681413 -0.1715348
## sample estimates:
##    prop 1    prop 2
## 0.5263158 0.8461538

#p-values>=0.1=>Reject H0
```

```
#Question 4.
#H0: P = 0.65
#H1: P>0.65
p= 414/600
#alpha = 0.05
prop.test(414,600,0.65,alternative = "greater",conf.level = 0.95,correct = FALSE)

##
##  1-sample proportions test without continuity correction
##
## data:  414 out of 600, null probability 0.65
## X-squared = 4.2198, df = 1, p-value = 0.01998
## alternative hypothesis: true p is greater than 0.65
## 95 percent confidence interval:
##  0.6581483 1.0000000
```

```
## sample estimates:
##    p
## 0.69

#p-values>=0.5=>Reject H0

#alpha = 0.01
prop.test(414,600,0.65,alternative = "greater",conf.level = 0.99,correct = FALSE)

##
##  1-sample proportions test without continuity correction
##
## data:  414 out of 600, null probability 0.65
## X-squared = 4.2198, df = 1, p-value = 0.01998
## alternative hypothesis: true p is greater than 0.65
## 99 percent confidence interval:
##  0.6445411 1.0000000
## sample estimates:
##    p
## 0.69

#p-values>=0.1=>Reject H0
```