21BDS0340

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Probability and Statistics Lab

Lab Assessment – IV

**Part a**

Code:

p = 50000

x = 46500

n = 28

sd = 8000

alpha = 0.05

h0 = "The claim is supported at 5% LOS"

h1 = "The claim is not supported at 5% LOS"

test\_tail\_type = 2

z\_alpha = qnorm(1 - alpha \* test\_tail\_type / 2) # two tailed test

z = abs((x - p) / (sd \* sqrt(n)))

print(paste("z: ", z))

print(paste("z\_alpha: ", z\_alpha))

if(z > z\_alpha){

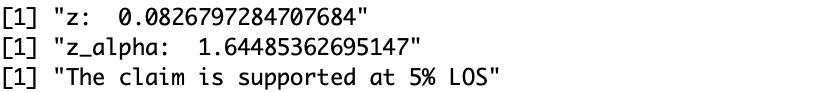
print(h1)

} else {

print(h0)

}

Output:



**Part b**

Code:

P1 = 0.2

n1 = 900

P2 = 0.15

n2 = 1600

alpha = 0.05

h0 = "The difference between the proportions is not significant"

h1 = "The difference between the proportions is significant"

test\_tail\_type = 2

p1 = P1 \* n1

p2 = P2 \* n2

P = (p1 + p2) / (n1 + n2)

Q = 1 - P

z = (P1 - P2) / sqrt((P \* Q \* (1/n1 + 1/n2)))

z\_alpha = qnorm(1 - alpha \* test\_tail\_type / 2) # two tailed test

print(paste("z: ", z))

print(paste("z\_alpha: ", z\_alpha))

if(z > z\_alpha){

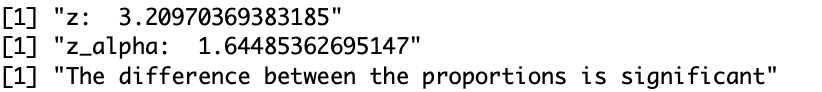
print(h1)

} else {

print(h0)

}

Output:



**Part c**

Code:

p1 = 42

n1 = 200

p2 = 18

n2 = 100

alpha = 0.05

h0 = "8% is a valid claim"

h1 = "8% is not a valid claim"

test\_tail\_type = 2

P1 = p1 / n1

P2 = p2 / n2

P = (p1 + p2) / (n1 + n2)

Q = 1 - P

z = (P1 - P2) / sqrt((P \* Q \* (1/n1 + 1/n2)))

z\_alpha = qnorm(1 - alpha \* test\_tail\_type / 2) # two tailed test

print(paste("z: ", z))

print(paste("z\_alpha: ", z\_alpha))

if(z > z\_alpha){

print(h1)

} else {

print(h0)

}

Output:

