Practical - 6

Large Sample Test

① Let population mean (amount spent per customer in a restuarant) is 250

A sample of 100 customer selected. A sample mean is calculated as 275 and SD 30.

Test hypothesis that population mean 250 or not at 5% level of significance

② A random sample test 1000 students it is found that 750 woe pen test.

The hypothesis that population propotion is 0.08 at 1% level of significance.

```
mo = 250
mx = 275
sd = 30
n=100
zcal = (mx - mo) / (sd / sqrt (n))
cat = ("value of z is = ", zcal)
 8.333333
pvalue = 2 * (1-pnorm (abs (zcal)))
pvalue
 0
```

value is less than 0.05 we will reject

The value of $H_0 = \mu = 250$.

② p=0.8

Q = 1-p

P = 750 /1000

n =1000

zcal = (p-P) / (sqrt (p * Q/n))

cat (" value of z is : ", zcal)

value of z is -3.952847

pvalue = 2 * (1-pnorm (abs (zcal)))

pvalue

7.72268 e-05.

③ Random sample of size 1000 and 2000 are drawn from 2 population with same 502.5 the 5 sample means are 67.5 and 68

Test hypothesis $\mu = \mu_2$ at 5% level of significance.

④ A study revel in 2 Hospital is given below test claim 2 hospital have same level of noise at 10% level of significance

HOS A	HOS B
84	34
61.2	59.4
7.9	7.5

③ n1 = 1000

n2 = 2000

mx1 = 67.5

sd1 = 2.5

sd2 = 2.5

zcal = (mx1 - mx2) / sqrt ((sd^2 /n1) + (sd2^2 /n2))

zcal

-5.163975

pvalue = 2 * (1 - pnorm (abs (zcal)))

pvalue

2.41754 e-07 (Rejected)

④ n1 = 84

n2 = 34

mx1 = 61.2

mx2 = 59.4

sd1 = 7.9

sd2 = 7.5

zcal = (mx1 - mx2) / sqrt ((sd1^2 /n1) + (sd 2^2))

zcal

1.62528

pvalue = 2 * (1 - pnorm (abs (zcal)))

pvalue

0.250211

$H_0 : P_1 = P_2$ against $H_1 : P_1 \neq P_2$

$n_1 = 600$

$n_2 = 900$

$P_1 = 400 / 600$

$P_2 = 450 / 900$

p = (n1 * P1 + n2 * P2) (n1+n2)

p

0.566067

q = 1-p

q

0.4333333

zcal = (p1 - p2) / sqrt (p * q * (1/n1 + 1 (n2)))

zcal

6.381534

pvalue = 2 * (1-pnorm (abs (zcal)))

pvalue

1.73322e-10

∴ value is less than 0.01 the value is rejected.

Practical 7

Small Sample Test.

① The marks are 10 stud are given by 63,67,66,68,69,70,70, 71,72. Test hypothesis that sample comes from population with avg marks 66.

Ho: u = 66

n = c (63,66, 67, 68, 70,70, 71,72)

t. test (x)

One Sample Test

data : x

t = 68.319, df = 9, pvalue = 1.588 e-13

alternative hypothesis mean is not equal to 10.95%

confidance interval 65.65171 70.14829

sample estimates

mean of x

Sample test

67.9

Since pvalue is smaller we reject the significance of at 5% level of significance

Los = 0.05

if (pvalue > 0.05 { cat ("accept Ho") } else { " reject Ho" } }

③ 2 groups of stud scored following marks.

Test hypothesis no. of significance btw 2 group.

Gp1 = C(18, 27, 21, 17, 20, 17, 23, 20, 22, 21)

Grp2 = C(16, 20, 14, 21, 20, 18, 13, 15, 17, 21)

t.test (x)

Two sample

data : x y

t = 2.2573 df = 16.376 pvalue = 0.03748

alternative hypothesis true diff in means is not equal to 0

95% confidance interval

0.1628205 5.0371795

sample estimates :-

mean of x mean of y

20.1 17.5

rejected

(3) The scale data of 6 shops before and after are special campaign given below

before : 53, 28, 31, 48, 50, 42
after : 58, 29, 30, 55, 56, 45

Test hypothesis that campaign is effective.

⇒ Ho : There is no sig diff of sales before and after campaign

x = c (53, 28, 31, 48, 50, 42)
y = c (58, 29, 30, 55, 56, 45)

t.test (x, y , paired = T, alternative = " greater ") .

paired t-test

data = x and y

t = -2.7815 , df = 5 pvalue = 0.9806
alternative hypo : true diff in means is greater than
0.95 percent confidance interval

-6.035547 INR

Sample estimates :
mean of diff -3.5

Accepted .

medical shops . 2 groups of patient

10, 12, 13, 11, 14

8, 9, 12, 14, 15, 10, 19.

If there is sig diff btw 2 medicines

o : there is no sig diff

x = c (10, 12, 13, 11, 14)

x = y (8, 9, 12, 14, 15, 10)

Sample t. test

t = 0.80384 df = 9.7994 pvalue = 0.440

95 percent confidence interval

-1.781171 3.781171

mean of x y

12 11

Accept 5% level of significance.

Practical 8

① μ : $\mu = 55$ $H_1 = \mu \neq 55$

n=100

mx = 52

mo = 55

sd = 7

zcal = (mx-mo) / (sd / sqrt (n))

zcal

[1] = -4.285714

pvalue = 2 * (1-pnorm (abs (zcal)))

pvalue

[1] 1.82153 e-05

we reject

② p= 350/700 Ho : p= 1/2

n=700 P= 0.5

q= 1-p

z= (p-P) / (sqrt (p*q (n)))

z

[1] 0

pv = 2 * (1-pnorm (abs (z)))

[1] = 1

Accept pvalue at Ho: p= 1/2

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(3) n1 = 1000

n2 = 1500

p1 = 0.02

p2 = 0.01

p = (n1 * p1 + n2 * p2) / (n1 + n2)

p

[1] 0.04

q = 1-p

z = (p1-p2) / sqrt (p * q * (1/n1 + 1/n2))

z

[1] 0.003474737

pv = 2 * (1-pnorm (abs (z)))

pv

[1] 0.03708364

we reject.

(4) H0: μ = 100

mx = 99 sd = 8

m0 = 100 n = 44

z = (mx - m0) / (sd / (sqrt (n)))

z

[1] -2.5

pv = 2 * (1-pnorm (abs (z)))

[1] 0.01241933

(5) Ho:

x = c(63, 63, 68, 69, 71, 71, 72)

t.t(test)

one sample T. Test

t = 47.94   df = 6   pvalue 5.522e-09

alternative

69.66479   71.62092

mean of x

68.14286

we reject Ho.

(6) Ho

n = 100

mo = 1200

mx = 1150

z=(mx-mo) / (sd / sqrt (n)))

z

[1] 4

pv = 2 * (1-pnorm (abs (z)))

[1] 6.334248 e-05

we reject.

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⑧ $n_1 = 200$

$n_2 = 300$

p_1

p_2

p = (n1 * p1 + n2 * p2) / (n1+n2)

q = 1-p

[1] = 0.9128709

pv = (2 * (1-pnorm (abs (2))))

pv [1] 0.3613104

we accept.

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