# 1 SAMPLE T-TEST (TWO TAILS) -> UNKNOWN VAR

t\_ones=function(data,mu0,alpha)

{

mu=mean(data)

n=length(data)

st=sd(data)

tstat=(mu-mu0)/(st/sqrt(n))

df=n-1

ttab=qt((1-(alpha/2)),df)

p=2\*(1-pt(abs(tstat),df))

LL=mu-(abs(ttab)\*(st/sqrt(n)))

UL=mu+(abs(ttab)\*(st/sqrt(n)))

if (p<=alpha)

{

dec="Reject H0"

}else

{

dec="Failed to Reject H0"

}

cat("Ha : mean != ",mu0,"\n")

cat("Statistics : ", tstat,"\n")

cat("CriVal : ", ttab,"\n")

cat("pval : ", p,"\n")

cat((1-alpha)\*100,"% CI : (",LL,"; ",UL,")","\n")

cat("Decision : ", dec)

}

#Check

x=c(1,2,3,4,5)

t\_ones(x,4,0.05)

t.test(x,mu=4)

#NO 4 -> 2t, 1s, prop, 0.05

p0=0.5

n=100

s=53

pest=s/n

qest=1-pest

a=0.05

zstat=(pest-p0)/sqrt((pest\*qest)/n)

ztab=qnorm(1-(a/2))

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

LL=pest-(abs(ztab)\*sqrt((pest\*qest)/n))

UL=pest+(abs(ztab)\*sqrt((pest\*qest)/n))

if (pv<=a)

{

dec="Reject H0"

}else

{

dec="Failed to Reject H0"

}

list(Statistics=zstat, CriVal=ztab, pval=pv, LL=LL, UL=UL, Decision=dec)

#NO 5 -> 2t, 1s, var, 0.05

var0=0.81

sd=1.2

n=10

a=0.05

chistat=(n-1)\*((sd^2)/var0)

v=n-1

chitab=qchisq(1-(a/2),v)

pv=2\*(1-pchisq(chistat,v))

LL=(n-1)\*((sd^2)/qchisq(1-(a/2),v))

UL=(n-1)\*((sd^2)/qchisq(a/2,v))

if (p<=alpha)

{

dec="Reject H0"

}else

{

dec="Failed to Reject H0"

}

list(Statistics=chistat, CriVal=chitab, pval=pv, LL=LL, UL=UL, Decision=dec)

#####Study Case 1

#####Left-side Z-test

mu0=16.43 #Hypothesized value

sigma=0.8 #Sigma

n=15 #Sample size

xbar=16 #Sample mean

alpha=0.05

z=(xbar-mu0)/(sigma/sqrt(n)) #Statistics

z.test=qnorm(alpha) #Critical value

p=pnorm(z) #P-value

UL=xbar+(qnorm(1-alpha)\*(sigma/sqrt(n))) #Upper limit

if(p<alpha)

{

keputusan="Reject H0"

} else

{

keputusan="Do not Reject H0"

}

list(Statistics=z, Ztab=z.test, Pval=p, Keputusan=keputusan, UL=UL)

#####Study Case 2

#####Two-tail t-test

mu0=8 #Hypothesized value

n=35 #Sample size

xbar=7.91 #Sample mean

s2=0.03 #Sample varians

s=sqrt(s2) #Sample standar deviation

alpha=0.01

t=(xbar-mu0)/(s/sqrt(n)) #Statistics

t.half=qt(1-alpha/2, df=n-1) #Critical value

#c(-t.half, t.half)

p=2\*pt(t, df=n-1) #P-value

LL=xbar-(qt(1-alpha/2, df=n-1))\*(s/sqrt(n)) #Lower limit

UL=xbar+(qt(1-alpha/2, df=n-1))\*(s/sqrt(n)) #Upper limit

if(p<alpha)

{

keputusan="Reject H0"

} else

{

keputusan="Do not Reject H0"

}

list(Statistics=t, ttab=t.half, Pval=p, Keputusan=keputusan, LL=LL, UL=UL)

#####Study Case 3

#####Right-side t-test

x=c(5,4,5,4,4,3,6,4,3,3,5,5,6,3,3,2,7,4,5,2,2,2,3,2)

n=length(x);n #Sample size

xbar=mean(x);xbar #Sample mean

mu0=3.18 #Hypothesized value

s=sd(x);s #Sample standar deviation

alpha=0.05

t=(xbar-mu0)/(s/sqrt(n)) #Statistics

t.test=qt(alpha, df=n-1) #Critical value

p=1-pt(t, df=n-1) #P-value

LL=xbar-(qt(1-alpha, df=n-1))\*(s/sqrt(n)) #Lower limit

if(p<alpha)

{

keputusan="Reject H0"

} else

{

keputusan="Do not Reject H0"

}

list(Statistics=t, ttab=t.test, Pval=p, Keputusan=keputusan, LL=LL)

#####Study Case 4

#####Two-tail proportion

p0=0.5 #Hypothesized value

n=100 #Sample size

ptop=53/100 #p topi

alpha=0.05

z=(ptop-p0)/sqrt(ptop\*(1-ptop)/n) #Statistics

z.half=qnorm(1-alpha/2) #Critical value

#c(-z.half, z.half)

p=2\*pnorm(z) #P-value

LL=ptop-(qnorm(1-alpha/2))\*sqrt((ptop\*(1-ptop)/n)) #Lower limit

UL=ptop+(qnorm(1-alpha/2))\*sqrt((ptop\*(1-ptop)/n)) #Upper limit

if(p<alpha)

{

keputusan="Reject H0"

} else

{

keputusan="Do not Reject H0"

}

list(Statistics=z, ztab=z.half, Pval=p, Keputusan=keputusan, LL=LL, UL=UL)

#####Study Case 5

#####Two-tail variation

sigma=0.9 #Hypothesized value

n=10 #Sample size

s=1.2 #Sample standar deviation

alpha=0.05

chi=(n-1)\*(s^2)/(sigma^2) #Statistics

c.kiri=qchisq(alpha/2,df=n-1)

c.kanan=qchisq(1-alpha/2,df=n-1) #Critical value

p=2\*pchisq(chi, df=n-1, lower.tail=FALSE) #P-value

LL=sqrt((n-1)\*(s^2)/(qchisq(1-alpha/2, df=n-1))) #Lower limit

UL=sqrt((n-1)\*(s^2)/(qchisq(alpha/2, df=n-1))) #Upper limit

if(p<alpha)

{

keputusan="Reject H0"

} else

{

keputusan="Do not Reject H0"

}

list(Statistics=chi, chitab=c(c.kiri, c.kanan), Pval=p, Keputusan=keputusan, LL=LL, UL=UL)