# **ONE SAMPLE Z-TEST:**

> sam<-rnorm(50,mean=68,sd=5)

> mu<-65

> sigma<-5

> z<-(mean(sam)-mu)/(sigma/sqrt(length(sam)))

> p<-2\*(1-pnorm(abs(z)))

> cat("Z-statistic:",z,"\n")

Z-statistic: 3.091438

> cat("P-value",p,"\n")

P-value 0.001991895

> if(p<0.05){

+ cat("Reject null hypothesis:The sample mean is significantly differnent from",mu,"\n")

+ }else{

+ cat("Fail to reject null hypothesis:There is not enough evidence to concude that the sample mean is different from",mu,"\n")

+ }

Reject null hypothesis:The sample mean is significantly differnent from 65

# **TWO SAMPLE Z-TEST:**

> a<-c(85,89,92,78,86,88,90,82,87,84)

> b<-c(80,81,85,79,83,81,84,78,82,80)

> z<-(mean(a)-mean(b))/sqrt(var(a)/length(a)+var(b)/length(b))

> var(b)/length(b)

[1] 0.49

> p<-2\*(1-pnorm(abs(z)))

> cat("Z-statistic",z,"\n")

Z-statistic 3.260958

> cat("P-value",p,"\n")

P-value 0.001110365

> if(p<0.05){

+ cat("Reject null hypothesis:The means of two groups are sifnificantly different\n")

+ }else{

+ cat("Fail to reject null hypothesis:There is not enough evidence to conclude that the means of two groups are different\n")

+ }

Reject null hypothesis:The means of two groups are sifnificantly different

# **ONE SAMPLE T-TEST:**

> sam<-rnorm(50,mean=68,sd=5)

> mu<-65

> t<-t.test(sam,mu=mu)

> print(t)

One Sample t-test

data: sam

t = 3.1403, df = 49, p-value = 0.002859

alternative hypothesis: true mean is not equal to 65

95 percent confidence interval:

65.83451 68.80065

sample estimates:

mean of x

67.31758

> if(t$p.value<0.05){

+ cat("Reject null hypothesis:The sample mean is significantly different from",mu,"\n")

+ }else{

+ cat("Fail to reject null hypothesis:There is not enough evidence to conclude that the sample mean is different from",mu,"\n")

+ }

Reject null hypothesis:The sample mean is significantly different from 65

# **TWO SAMPLE T-TEST:**

> a<-c(85,89,92,78,86,88,90,82,87,84)

> b<-c(80,81,85,79,83,81,84,78,82,80)

> t<-t.test(a,b)

> print(t)

Welch Two Sample t-test

data: a and b

t = 3.261, df = 13.847, p-value = 0.005759

alternative hypothesis: true difference in means is not equal to 0

95 percent confidence interval:

1.639673 7.960327

sample estimates:

mean of x mean of y

86.1 81.3

> if(t$p.value<0.05){

+ cat("Reject null hypothesis:The means of two groups are significantly different\n")

+ }else{

+ cat("Fail to reject null hypothesis:There is not enough evidence to conclude that the means oftwo groups are different\n")

+ }

Reject null hypothesis:The means of two groups are significantly different