Quiz 3 R Script

> library(NCStats)  
> plt <- FALSE  
>   
> ## Probability Questions  
> mn <- 65.1; s <- 107.7  
> ( distrib(90,mean=mn,sd=s/sqrt(35),lower.tail=FALSE,plot=plt) )

[1] 0.0856898

> ( ab <- distrib(90,mean=mn,sd=s/sqrt(60),plot=plt))

[1] 0.9633413

> ( a <- distrib(50,mean=mn,sd=s/sqrt(60),plot=plt))

[1] 0.1387356

> ab-a

[1] 0.8246057

> ( distrib(0.25,mean=mn,sd=s/sqrt(50),type="q",plot=plt) )

[1] 54.82679

> (distrib(0.75,mean=mn,sd=s/sqrt(50),type="q",plot=plt) )

[1] 75.37321

> ## First p-value and conf. regions  
> xbar1 <- 515; mu01 <- 500  
> sigma1 <- 50; n1 <- 25; SE1=sigma1/sqrt(n1)  
> ( pval1 <- 2\*distrib(xbar1,mean=mu01,sd=SE1,lower.tail=FALSE,plot=plt) )

[1] 0.1336144

> ( zstar1 <- distrib(0.995,type="q",plot=plt))

[1] 2.575829

> ( LCI1 <- xbar1-zstar1\*SE1 )

[1] 489.2417

> ( UCI1 <- xbar1+zstar1\*SE1 )

[1] 540.7583

> ## Calc beta  
> mua <- 465  
> ( rejreg <- distrib(0.01,mean=mu01,sd=SE1,type="q",plot=plt) )

[1] 476.7365

> ( beta <- distrib(rejreg,mean=mua,sd=SE1,lower.tail=FALSE,plot=plt) )

[1] 0.1202672

> ## Second p-value anc conf. regions  
> xbar2 <- 2504; mu02 <- 2200  
> sigma2 <- 1200; n2 <- 118; SE2=sigma2/sqrt(n2)  
> ( pval2 <- distrib(xbar2,mean=mu02,sd=SE2,lower.tail=FALSE,plot=plt) )

[1] 0.0029625

> ( zstar2 <- distrib(0.90,type="q",lower.tail=FALSE,plot=plt))

[1] -1.281552

> ( LCB2 <- xbar2+zstar2\*SE2 )

[1] 2362.428

> ## Sample size calculation  
> me <- 3; sigma3 <- 20  
> ( zstar3 <- distrib(0.95,type="q",plot=plt) )

[1] 1.644854

> ( mice <- (zstar3\*sigma3/me)^2 )

[1] 120.2464

> ceiling(mice)

[1] 121