Assignment - 1

Session 9 – Statistical Inference

1. If Z is norm (mean = 0, sd = 1)
Find P(Z > 2.64)
Find P(|Z| > 1.39)

Ans:
#P(Z > 2.64)
#We need to take the whole of the right hand side (area 0.5)
#and subtract the area from z = 0 to z = 2.64, which we get from the z-table.
#the probability value of z =2.64 in table is 0.4959
#so P(Z > 2.64)=0.5-P(0 < z < 2.64)=0.5-0.4959=0.0041
#or we can do like this

```
> #P(|Z| > 1.39)
> #we can find by pnorm function too
> pnorm(1.39)
[1] 0.9177356
> pnorm(-1.39)
[1] 0.08226444
```

#1-(pnorm(1.39)-pnorm(-1.39))
#1-(0.9177356-0.08226444)
#1-0.8354712
#0.1645288 (answer)

2. Suppose p = the proportion of students who are admitted to the graduate school of the University of
California at Berkeley, and suppose that a public relation officer boasts that UCB has historically had a
40% acceptance rate for its graduate school. Consider the data stored in the table UCBAdmissions from
1973. Assuming these observations constituted a simple random sample, are they consistent with the
officerâ..s claim, or do they provide evidence that the acceptance rate was significantly less than 40%?
Use an Î± = 0.01 significance level.

Ans:

```
> -qnorm(0.99)
[1] -2.326348
> #Now to find out our test statistic
> newucb_data<-as.data.frame(UCBAdmissions)
```

```
> View(newucb_data)
> dim(newucb_data)
[1] 24  4
> summary(newucb_data$Admit)
Admitted Rejected
      12       12
> phat<-12/(24)
> t <- (phat-0.4)/sqrt(0.4*0.6/(24))
> t
[1] 1
```

#by calculations it is clear that our test statistic is not less than -2.326348

#So we accept our null hypothesis Ho

#hence we say that the observed data are consistent with the officer's claim at alpha = 0.01(Level of Significance)