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:

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| --- |
| #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

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| #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) |