

Session 9 – Statistical

Inference

Assignment - 1



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**Introduction**



This assignment will help you to understand the key concepts learnt in this session.

**Objective**



This assignment will test your skills on Theorems and Tests in R.

**Prerequisites**



Not Applicable

**Associated Data Files**



Not Applicable

**Problem Statement**



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

Find P(|Z| > 1.39)

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

1. 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.

qnorm(0.99)

#[1] -2.326348

#Our only remaining task is to find the value of the test statistic and see where it falls relative

#to the critical value. We can find the number of people admitted and not admitted to the UCB

#graduate school with the following.

A <- as.data.frame(UCBAdmissions)

head(A)

xtabs(Freq ~ Admit, data = A)

#Now we calculate the value of the test statistic.

phat <- 1755/(1755 + 2771)

(phat - 0.4)/sqrt(0.4 \* 0.6/(1755 + 2771))

#Our test statistic is not less than ???2.32, so it does not fall into the critical region. Therefore,

#we fail to reject the null hypothesis that the true proportion of students admitted to graduate

#school is less than 40% and say that the observed data are consistent with the officer's claim at

#the   
 = 0.01 significance level.

**Expected Output**



Not Applicable

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