

## ACADGILD ASSIGNMENT 9.1

1. Z is norm (mean = 0, sd = 1)

find  $P(Z > 2.64)$

find  $P(|Z| > 1.39)$

**ANSWER:**

#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))

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 UCBA admissions from 1973. Assuming these observations constituted a simple random sample, are they consistent with the officer's claim, or do they provide evidence that the acceptance rate was significantly less than 40%?

Use an  $\hat{\alpha} = 0.01$  significance level.

**ANSWER:**

> -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(UCBA admissions)
```

```
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))
```

```
[1] -1.680919
```

```
> qnorm(0.99)
```

```
[1] 2.326348
```

```
> A <- as.data.frame(UCBAdmissions)
```

```
> head(A)
```

```
Admit Gender Dept Freq
```

```
1 Admitted Male A 512
```

```
2 Rejected Male A 313
```

```
3 Admitted Female A 89
```

```
4 Rejected Female A 19
```

```
5 Admitted Male B 353
```

```
6 Rejected Male B 207
```

```
> xtabs(Freq ~ Admit, data = A)
```

```
Admit
```

```
Admitted Rejected
```

```
1755 2771 > phat <- 1755/(1755 + 2771)
```

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

```
[1] -1.680919
```

Our test statistics is not less than -2.32, so it does not fall into 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  $\alpha=0.01$  significance level.