R STUDIO – EXERCISE 7

QUESTION 1

Suppose that 12% of apples harvested in an orchard last year was rotten. 30 out of 214 apples in a harvest sample this year turns out to be rotten. At 0.05 significance level, can we reject the null hypothesis that the proportion of rotten apples in harvest stays below 12% this year?

```
> P = 0.12
> Q = 1 - P
> p = 30/214
> H0 : p < 0.12
> H1 : p >= 0.12
> n = 214
> zcal = (p-P)/sqrt((P*Q)/n)
> alpha = 0.05
> ztab = qnorm(1-alpha)
> zcal = abs(zcal)
> zcal
[1] 0.908751
> ztab
[1] 1.644854
> if(zcal <= ztab){print("Accept H0")} else{print("Reject H0")}
[1] "Accept H0"
```

QUESTION 2

Suppose 60% of citizens voted in last election. 85 out of 148 people in a telephone survey said that they voted in current election. At 0.05 significance level, can we reject the null hypothesis that the proportion of voters in the population is above 60% this year?

```
> P = 0.6
> Q = 1-P
> p = 85/148
> H0 : p > 0.6
> H1 : p <= 0.6
```

```
> n = 148
> zcal = (p-P)/sqrt((P*Q)/n)
> zcal = abs(zcal)
> ztab = qnorm(1-alpha)
> zcal
[1] 0.6375983
> ztab
[1] 1.644854
> if(zcal <= ztab){print("Accept H0")} else{print("Reject H0")}
[1] "Accept H0"
```

QUESTION 3

The mean weight obtained from a random sample of size 100 is 64 gms. The SD of the weight distribution of the population is 3 gms. Test the statement that the mean weight of the population is 67 gms at 5% level of significance. Also set up 99% confidence limits of the mean weight of the population.

```
> n = 100
> xbar = 64
> mu = 67
> sigma = 3
> H0 : xbar = mu
> H1 : xbar != mu
> zcal = (xbar - mu)/(sigma/sqrt(n))
> zcal = abs(zcal)
> alpha = 0.05
> ztab = qnorm(1-(alpha)/2)
> zcal
[1] 10
> ztab
[1] 1.959964
> if(zcal <= ztab){print("Accept H0")} else{print("Reject H0")}
[1] "Reject H0"
> FOR 99% confidence limits :
> alpha = 0.01
> ztab = qnorm(1-(alpha)/2)
```

```
> ztab
[1] 2.575829
> limit1 = xbar + ztab*(sigma/sqrt(n))
> limit2 = xbar - ztab*(sigma/sqrt(n))
> limit1
[1] 64.77275
> limit2
[1] 63.22725
```

QUESTION 4

The average marks scored by 32 boys is 72 with a SD of 8, while that for 36 girls is 70 with a SD of 6.

Test at 1% LOS whether the boys perform better than girls.

```
> x1bar = 72
> n1 = 32
> s1 = 8
> x2bar = 70
> n2 = 36
> s2 = 6
> H0 : x1bar = x2bar
> H1 : x1bar > x2bar
> alpha = 0.01
> zcal = (x1bar - x2bar)/sqrt(((s1^2)/n1)+((s2^2)/n2))
> zcal = abs(zcal)
> ztab = qnorm(1-alpha)
> zcal
[1] 1.154701
> ztab
[1] 2.326348
> if(zcal <= ztab){print("Accept H0")} else{print("Reject H0")}
[1] "Accept H0"
```