**Experiments – VI**

**Test of Significance (Large Samples)**

**Problem1** : In two large populations, there are 30% and 20% respectively of fair haired people. In this difference likely to be hidden in samples of 1200 and 900 respectively from the two populations. Test the hypothesis that any significant difference in fair hair people of two populations at 5% level.

Solution:

Solution :

**Null Hypothesis H0**: Assume that the sample proportion are equal i.e, the difference in population proposition is likely to be hidden in sampling H0: p1=p2

**Alternative Hypotheisi H1** : p1p2

Formula for test statstics

R-Commands:

z.testprop = function(p1, p2, n1,n2){ z = (p1 -p2) / (sqrt((p1\*(1-p1))/n1 + (p2\*(1-p2))/n2))}

z=z.testprop(30/100,20/100,1200,900)

calcz<-abs(z)

calcz

5.324139

zalpha<- qnorm(0.975)

zalpha

1.959964

if(calcz < zalpha){print("Null hypothesis is accepted")}else{print("Null Hypothesis is rejected")}

Null Hypothesis is rejected

Conclusion: Null Hypothesis (H0) is rejected

That the difference in population proportions is unlikely that the real difference will be hidden

**Problem 2**: The mean life of a sample of 10 electric bulbs was found to be 1456 hours with standard deviation 423. A second sample of17 bulbs chosen from a different batch showed a mean life of 1280 hours with standard deviation of 398 hours. Is there a significant difference between the means of two batches?

Solution :

**Null Hypothesis H0**: Assume that the sample proportion are equal i.e, significant difference between the means of two batches H0: p1=p2

**Alternative Hypotheisi H1 : p1p2**

Formula for test statstics

R-Commands:

z.test2sam = function(x1bar, x2bar, var.a, var.b,n1,n2){zeta = (x1bar -x2bar) / (sqrt(var.a/n1 + var.b/n2))return(zeta) }

z=z.test2sam(1456,1280,423^2,398^2,10,17)

calcz<-abs(z)

1.066945

zeta=qnorm(0.975)

zeta

1.959964

if(calcz < zeta){print("Null hypothesis is accepted")}else{print("Null Hypothesis is rejected")}

Null hypothesis is accepted

Conclusion: Null hypothesis is accepted ,

there is no difference between the means life of electric bulbs of two batches.