Experiment – 3

CHI-SQUARE TEST AND F-TEST

CHI-SQUARED TEST

1.

The below table gives the distribution of students according to the family type and the anxiety level

Family type	Anxiety level		
	Low	Normal	High
Joint family	35	42	61
Nuclear family	48	51	68

Aim:

To conduct Chi-squared test for the above data.

Data:

```
> data<-matrix(c(35,42,61,48,51,68),ncol=3,byrow=1)
```

Syntax:

```
> chisq.test(data)
```

Output:

```
     [,1] [,2] [,3]
[1,]   35   42   61
[2,]   48   51   68

        Pearson's Chi-squared test

data:  data
X-squared = 0.53441, df = 2, p-value = 0.7655
```

Conclusion:

Here P value (0.7655) > 0.05. Hence there is no evidence to reject the Null hypothesis. So we consider the anxiety level and family type as independent.

F-Test

2.

Five Measurements of the output of two units have given the following results (in kilograms of material per one hour of operation) .Assume that both samples have been obtained from normal populations, test at 10% significance level if two populations have the same variance.

Unit A	*14.1*	*10.1*	*14.7*	*13.7*	*14.0*
Unit B	*14.0*	*14.5*	*13.7*	*12.7*	*14.1*

Aim:

To conduct Variance Ratio Test or F-Test for the above data.

Data:

```
> Unit_A=c(14.1,10.1,14.7,13.7,14.0)

> Unit_B=c(14.0,14.5,13.7,12.7,14.1)
```

Syntax:

```
> var.test(Unit_A, Unit_B)
```

Output:

```
        F test to compare two variances

data:  Unit_A and Unit_B
F = 7.3304, num df = 4, denom df = 4, p-value = 0.07954
alternative hypothesis: true ratio of variances is not equal to 1
95 percent confidence interval:
  0.7632268 70.4053799
sample estimates:
ratio of variances
          7.330435
```

Conclusion:

Here the p-value >0.05 ,then there is no evidence to reject the null hypothesis.