DELHI TECHNOLOGICAL UNIVERSITY

PROBABILITY AND STATISTICS (MC-205)

PRACTICAL FILE

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EXPERIMENT 10

ANOVA Test

SOURCE CODE:

1. One Way Test

```
dt<-data.frame(id=c(1:5), name=c('a','b','c','d','e'),
income=c(100,150,125,200,230), age=c(23,25,24,26,27),
stringsAsFactors=FALSE)

one.way<-aov(dt$income~dt$age, data=dt)

one.way

summary(one.way)
```

2. Two Way Test

```
dt<-data.frame(id=c(1:5), name=c('a','b','c','d','e'),
income=c(100,150,125,200,230), age=c(23,25,24,26,27),
stringsAsFactors=FALSE)

two.way<-aov(dt$id~dt$income+dt$age, data=dt)

two.way

summary(two.way)
```

OUTPUT:

1. One way test

```
> dt
  id name income age
1  1    a    100  23
2  2    b    150  25
3  3    c    125  24
4  4    d    200  26
5  5    e    230  27
> 
```

```
> one.way<-aov(dt$income~dt$age, data=dt)
> one.way
Call:
   aov(formula = dt$income ~ dt$age, data = dt)

Terms:
                  dt$age Residuals
Sum of Squares  11222.5     197.5
Deg. of Freedom       1         3

Residual standard error: 8.113774
Estimated effects may be unbalanced
> summary(one.way)
            Df Sum Sq Mean Sq F value  Pr(>F)
dt$age       1  11222   11222   170.5 0.00097 ***
Residuals    3    197      66
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

2. Two way test

```
> dt
  id name income age
1  1    a    100  23
2  2    b    150  25
3  3    c    125  24
4  4    d    200  26
5  5    e    230  27
> 
```

```
> two.way<-aov(dt$id~dt$income+dt$age, data=dt)
> two.way
Call:
   aov(formula = dt$id ~ dt$income + dt$age, data = dt)

Terms:
                dt$income   dt$age Residuals
Sum of Squares   8.415061 0.050761  1.534177
Deg. of Freedom         1        1         2

Residual standard error: 0.8758359
Estimated effects may be unbalanced
> summary(two.way)
            Df Sum Sq Mean Sq F value Pr(>F)
dt$income    1  8.415   8.415  10.970 0.0803 .
dt$age       1  0.051   0.051   0.066 0.8210
Residuals    2  1.534   0.767
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

CONCLUSION:

Analysis of variance (**ANOVA**) is a collection of statistical models and their associated estimation procedures (such as the "variation" among and between groups) used to analyse the differences among group means in a sample.

The ANOVA is based on the law of total variance, where the observed variance in a particular variable is partitioned into components attributable to different sources of variation. In its simplest form, ANOVA provides a statistical test of whether two or more population means are equal.

One-way or **two-way** refers to the number of independent variables (IVs) in your Analysis of Variance test.