1. Use the given link yeast Set.

Answer the below questions:

a. Perform ANOVA test on the discriminant analysis scores of nuclear localization signals of both nuclear

and non-nuclear proteins by class variables (Target).

disc.data <- read.csv("yeast.csv")

str(disc.data)

describe(disc.data[2:5])

describeBy(disc.data[2:5], disc.data$Race

pairs.panels(disc.data[2:5])

Self.Mod <- aov(Selfconsciousnes ~ Race, data = disc.data)

summary(Self.Mod)

TukeyHSD(Self.Mod)

Y <- cbind(disc.data$Affective.Instability, disc.data$Depression, disc.data$Anxiety, disc.data$Selfconsciousnes)

colnames(Y) = c("Affective.Instability", "Depression", "Anxiety", "Selfconsciousness")

Model1 <- manova(Y ~ Race, data = disc.data)

summary(Model1)

Model1.a <- manova(cbind(Affective.Instability, Depression, Selfconsciousnes, Anxiety) ~ Race, data = disc.data)

summary(Model1.a)

Model2 <- lm(Y ~ Race, data = disc.data)

anova(Model2)

Model1.disc <- candisc(Model1, term = "Race")

Model1.disc

summary(Model1.disc)

heplot(Model1.disc, ylim = c(-2, 2.5))

b. Which class is significantly different from others?

Difference Between One Way and Two Way ANOVA

When it comes to research, in the field of business, economics, psychology, sociology, biology, etc. the Analysis of Variance, shortly known as ANOVA is an extremely important tool for analysis of data. It is a technique employed by the researcher to make a comparison between more than two populations and help in performing simultaneous tests. There is a two-fold purpose of ANOVA. In one way ANOVA the researcher takes only one factor.

As against, in the case of two-way ANOVA, the researcher investigates two factors concurrently. For a layman these two concepts of statistics are synonymous. However, there is a difference between one-way and two-way ANOVA.

| **BASIS FOR COMPARISON** | **ONE WAY ANOVA** | **TWO WAY ANOVA** |
| --- | --- | --- |
| Meaning | One way ANOVA is a hypothesis test, used to test the equality of three of more population means simultaneously using variance. | Two way ANOVA is a statistical technique wherein, the interaction between factors, influencing variable can be studied. |
| Independent Variable | One | Two |
| Compares | Three or more levels of one factor. | Effect of multiple level of two factors. |
| Number of Observation | Need not to be same in each group. | Need to be equal in each group. |
| Design of experiments | Need to satisfy only two principles. | All three principles needs to be satisfied. |