Statistical Significance of Dissimilarity Matrix using MRPP and ANOSIM

In [164]:
```
library(vegan)
library(mefa)
```

In [170]:
```
rankdata<-read.csv(file="/Users/Data/simple_data_rankings.csv")
rankdata <- rankdata[-1]
```

In [138]:
```
rawdata<-read.csv(file="/Users/Data/simple_rawdata.csv")
rawdata <- rawdata[-1]
rawdata <- rawdata[-1,]
```

In [175]:
```
for (j in 2:10){
    for (i in 1:(j-1)){
        rawdata[i,j] <- 0
        rankdata[i,j] <- 0
    }}
```

In [181]:
```
#create distance matrix for raw data

col1 <- rawdata[1:10,1]
col2 <- rawdata[2:10,2]
col3 <- rawdata[3:10,3]
col4 <- rawdata[4:10,4]
col5 <- rawdata[5:10,5]
col6 <- rawdata[6:10,6]
col7 <- rawdata[7:10,7]
col8 <- rawdata[8:10,8]
col9 <- rawdata[9:10,9]
col10 <- rawdata[10:10,10]
vraw <- c(col1,col2,col3,col4,col5,col6,col7,col8,col9,col10)
raw.distance.matrix <- vec2dist(vraw,11)
```

In [182]:
```
#create distance matrix for ranked data

col1 <- rankdata[1:10,1]
col2 <- rankdata[2:10,2]
col3 <- rankdata[3:10,3]
col4 <- rankdata[4:10,4]
col5 <- rankdata[5:10,5]
col6 <- rankdata[6:10,6]
col7 <- rankdata[7:10,7]
col8 <- rankdata[8:10,8]
col9 <- rankdata[9:10,9]
col10 <- rankdata[10:10,10]
vrank <- c(col1,col2,col3,col4,col5,col6,col7,col8,col9,col10)
rank.distance.matrix <- vec2dist(vrank,11)
```

In [189]:
```
#create grouping of data

rdata <- factor(c(1,1,1,1,2,2,2,2,2,2,2),labels=c("Year 1","Year 2"))
```

In [200]:
```
model.mrpp <- mrpp(raw.distance.matrix, rdata,permutations=10000)
```

In [198]:
```
model.anosim <- anosim(rank.distance.matrix, rdata,permutations=10000)
```

In [202]:
```
model.mrpp
```

```
Call:
mrpp(dat = raw.distance.matrix, grouping = rdata, permutations = 10000)


Dissimilarity index:
Weights for groups:  n

Class means and counts:

      Year 1 Year 2
delta 0.1361 0.172
n     4      7

Chance corrected within-group agreement A: 0.1732
Based on observed delta 0.159 and expected delta 0.1923

Significance of delta: 0.0024998
Permutation: free
Number of permutations: 10000
```

In [210]:
```
summary(model.anosim)
```

```
Call:
anosim(dat = rank.distance.matrix, grouping = rdata, permutations = 100
00)
Dissimilarity:

ANOSIM statistic R: 0.5331
      Significance: 0.0025997

Permutation: free
Number of permutations: 10000

Upper quantiles of permutations (null model):
  90%   95% 97.5%   99%
0.212 0.280 0.380 0.454

Dissimilarity ranks between and within classes:
        0%   25%  50%   75% 100%  N
Between 14 25.75 35.5 45.25   55 28
Year 1   2  4.75 11.0 12.75   24  6
Year 2   1  8.00 21.0 37.00   52 21
```

In [207]:
```
plot(model.anosim)
```

```
Warning message in bxp(structure(list(stats = structure(c(14, 25.5, 35.
5, 45.5, :
“some notches went outside hinges ('box'): maybe set notch=FALSE”
```