cbfDTW

Code ▾

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```
load(file = '~/Downloads/CBF.rda')
#CBF
```

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```
training_data <- CBF$data_train

test_data <- CBF$data_test

training_labels <- CBF$labels_train

test_labels <- CBF$labels_test
```

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```
require(dtwclust)
```

```
Loading required package: dtwclust
Loading required package: proxy

Attaching package: ‘proxy’

The following objects are masked from ‘package:stats’:

    as.dist, dist

The following object is masked from ‘package:base’:

    as.matrix

Loading required package: dtw
Loaded dtw v1.21-3. See ?dtw for help, citation("dtw") for use in publication.

Registered S3 method overwritten by 'dplyr':
  method           from
  print.rowwise_df
Registered S3 methods overwritten by 'htmltools':
  method               from
  print.html           tools:rstudio
  print.shiny.tag      tools:rstudio
  print.shiny.tag.list tools:rstudio
dtwclust:
Setting random number generator to L'Ecuyer-CMRG (see RNGkind()).
To read the included vignettes type: browseVignettes("dtwclust").
See news(package = "dtwclust") after package updates.
```

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```
require(mcclust)
```

```
Loading required package: mcclust
Loading required package: lpSolve
```

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```
clust.hier <- tsclust(training_data, type = "h", k = 3L, distance = "dtw2", trace=TRUE,
 control = hierarchical_control(method = "ward.D"))
```

```


Calculating distance matrix...
Performing hierarchical clustering...
Extracting centroids...

    Elapsed time is 2.092 seconds.
```

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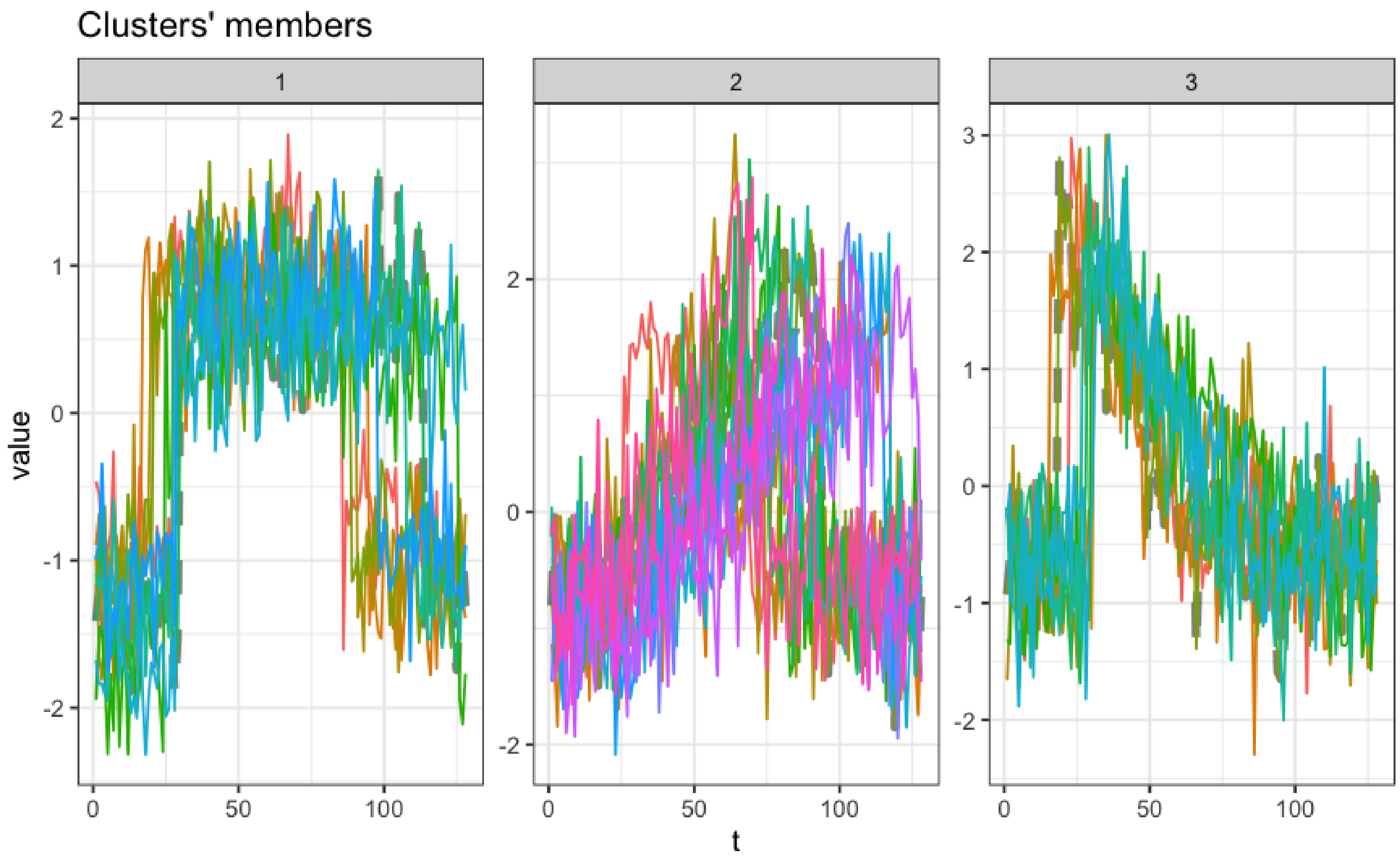
```
plot(clust.hier, type="sc")
```



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```
l <- clust.hier@cluster
l
```

```
  1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24  25  26  27  28  29  3
0 
  1   1   2   3   2   2   1   3   2   1   2   2   1   2   2   3   2   2   1   3   2   2   1   1   3   3   2   3   3 
1 
```

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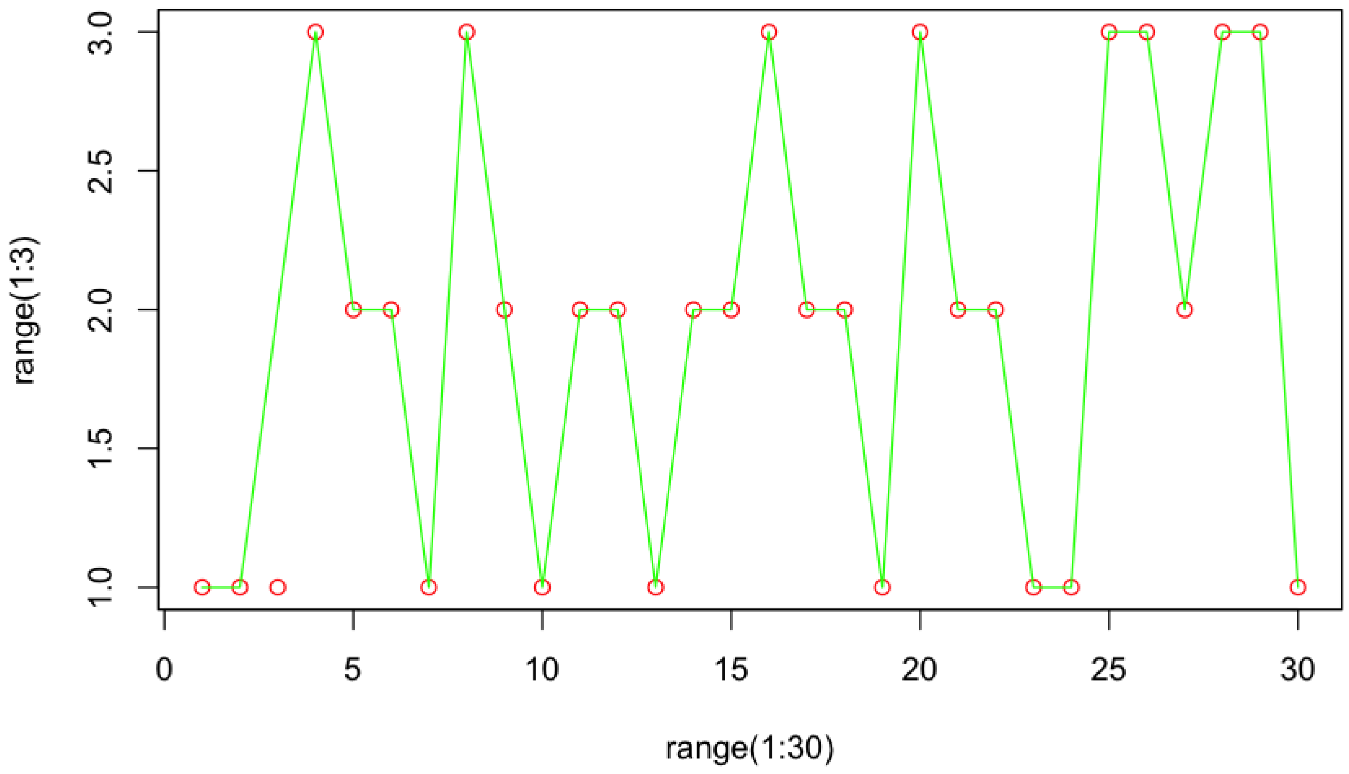
```
plot(range(1:30),range(1:3), type='n')
points(training_labels, col='red')
```

Hide

```
lines(l, col='green')
```



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```
#l[3]
```

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```
#test_data[1,]
test_labels[1]
```

```
[1] 2
```

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```
n <- predict(clust.hier,newdata=unlist(list(test_data[1,])))
n
```

```
[1] 2
```

Hide

```
predicted_labels_hier = c()

for (i in 1:900) {
  #print(test_data[i,])
  predicted_labels_hier[i] <- predict(clust.hier,newdata=unlist(list(test_data[i,])))
  #print(n)
}
#predicted_labels
#plot(range(1:900),range(1:3), type='n')
#lines(test_labels, col='red')
#lines(predicted_labels, col='green')
table(predicted_labels_hier,test_labels)
```

```
                     test_labels
predicted_labels_hier   1   2   3
                    1 261  10  17
                    2  29 286   0
                    3  10   2 285
```

833/900 = 92.556%

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```


index_hier=arandi(predicted_labels_hier,test_labels)
unadjusted_hier=arandi(predicted_labels_hier,test_labels,adjust=FALSE)
index_hier
```

```
[1] 0.7900694
```

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```
unadjusted_hier
```

```
[1] 0.906768
```

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```
clust.pr <- tsclust(training_data, type = "partitional", k = 3L, distance = "dtw2", trac
e=TRUE)
```

```


    Precomputing distance matrix...

Iteration 1: Changes / Distsum = 30 / 129.3068
Iteration 2: Changes / Distsum = 3 / 120.4838
Iteration 3: Changes / Distsum = 0 / 120.4838

    Elapsed time is 2.038 seconds.
```

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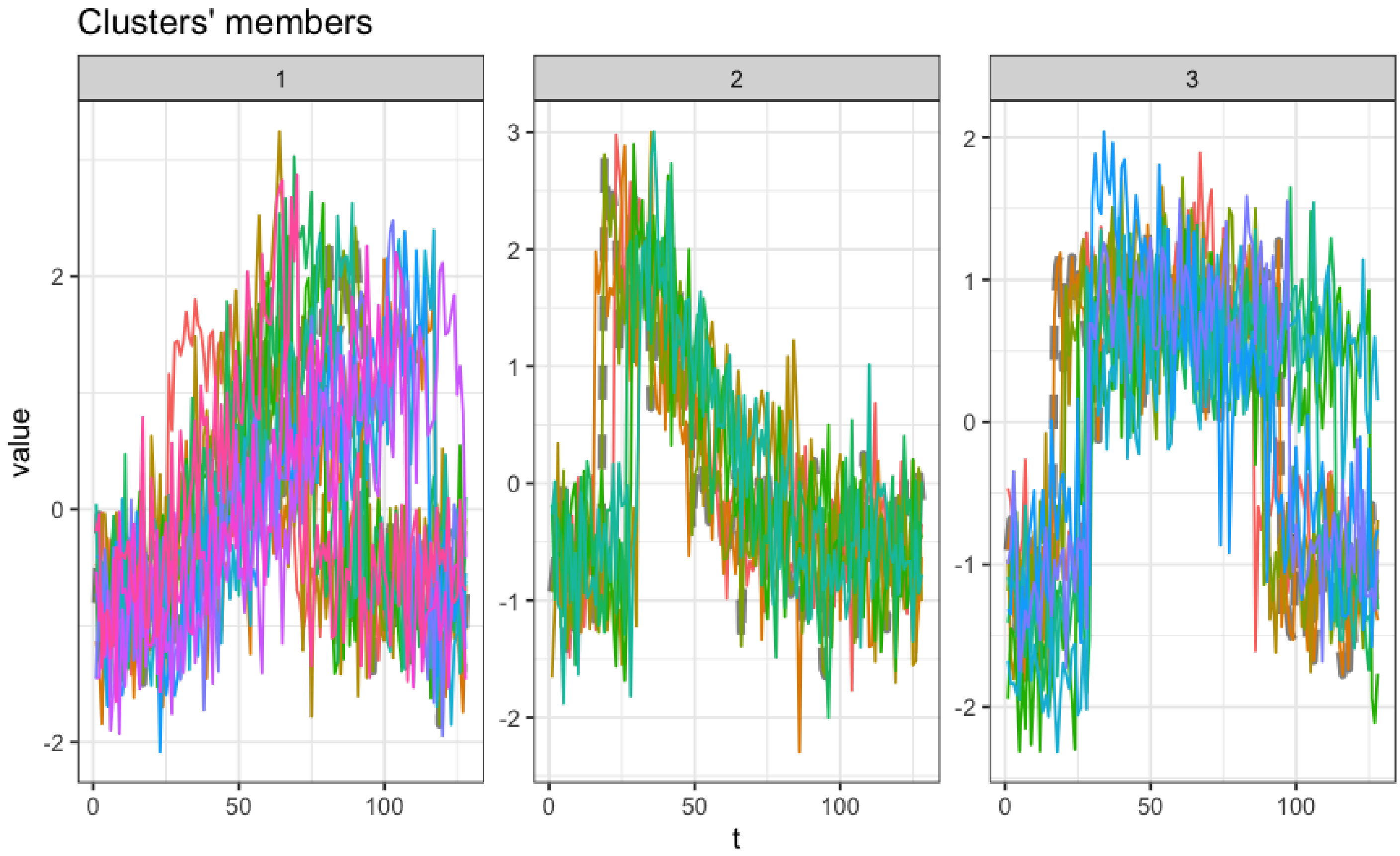
```
plot(clust.pr, type="sc")
```



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```
l <- clust.pr@cluster
l
```

```
 [1] 3 3 1 2 1 1 3 2 1 3 1 1 3 1 1 2 1 1 3 2 1 1 3 3 3 2 1 2 2 3
```

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```
plot(range(1:30),range(1:3), type='n')
points(training_labels, col='red')
```

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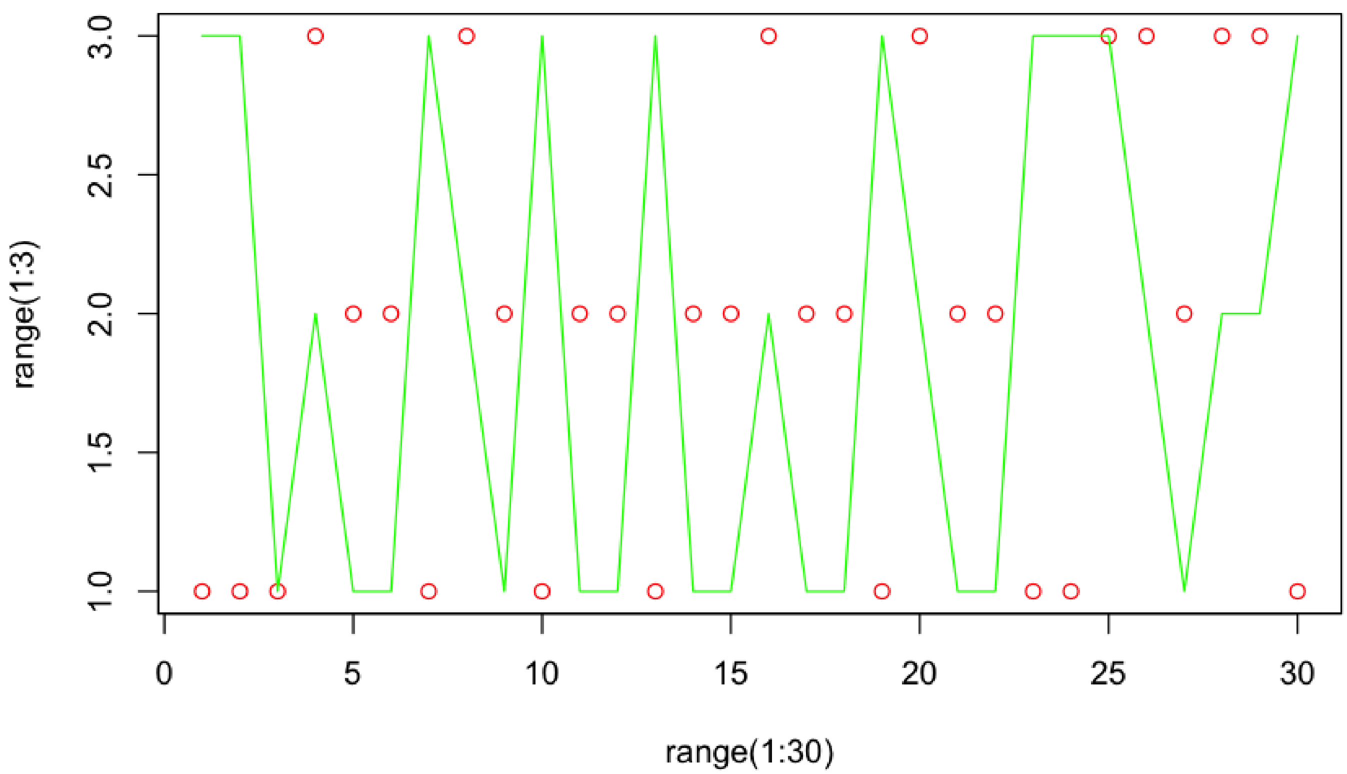
```
lines(l, col='green')
```



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```
predicted_labels_par = c()

for (i in 1:900) {
  #print(test_data[i,])
  predicted_labels_par[i] <- predict(clust.pr,newdata=unlist(list(test_data[i,])))
  #print(n)
}
#predicted_labels
#plot(range(1:900),range(1:3), type='n')
#lines(test_labels, col='red')
#lines(predicted_labels, col='green')
table(predicted_labels_par,test_labels)
```

```
                    test_labels
predicted_labels_par   1   2   3
                   1  12 291   0
                   2  10   2 262
                   3 278   5  40
```

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```
#predicted_labels
#test_labels
index_par=arandi(predicted_labels_par,test_labels)
unadjusted_par=arandi(predicted_labels_par,test_labels,adjust=FALSE)
index_par
```

```
[1] 0.7879415
```

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```
unadjusted_par
```

```
[1] 0.9057496
```

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```
colors = c('red','blue')
types = c('Hierarchical Clustering','Partitional Clustering')
```

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```
plot(NULL,NULL, type='n',ylim=c(0.75,0.8), xlim=c(0,2), xlab='Index', ylab='Rand Index',
main='Random Index of Hierarchical and Partitional Clustering')

legend("topright",legend = types, col = colors, title = 'Clustering Types', pch=1)
```

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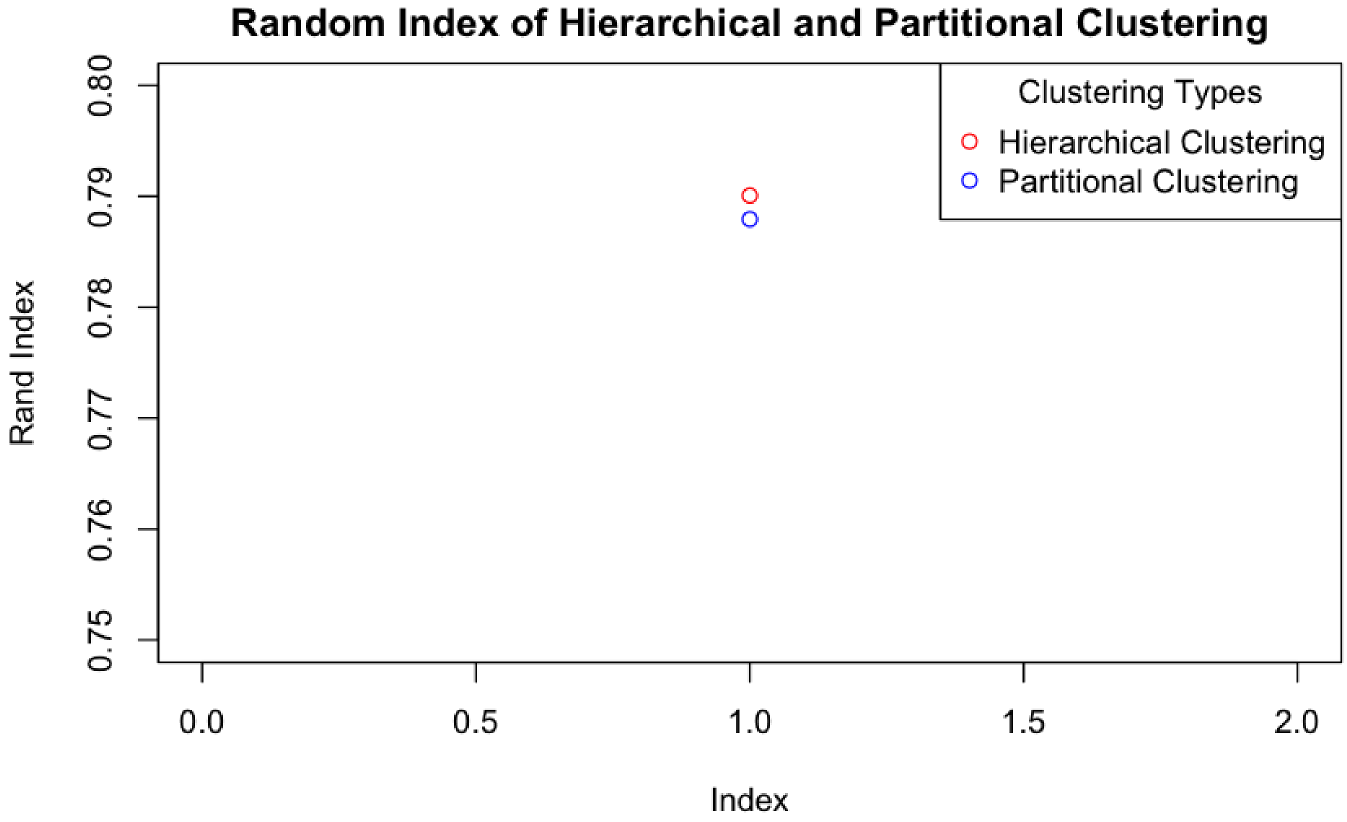
```
par(new=TRUE)

points(index_hier, col='red')
```

Hide

```
points(index_par, col='blue')
```



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```
NA
NA
```

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```
plot(NULL,NULL, type='n',ylim=c(0.904,0.908), xlim=c(0,2), xlab='Index', ylab='Rand Inde
x', main='Adjusted Index of Hierarchical and Partitional Clustering')

legend("topright",legend = types, col = colors, title = 'Clustering Types', pch=1)
```

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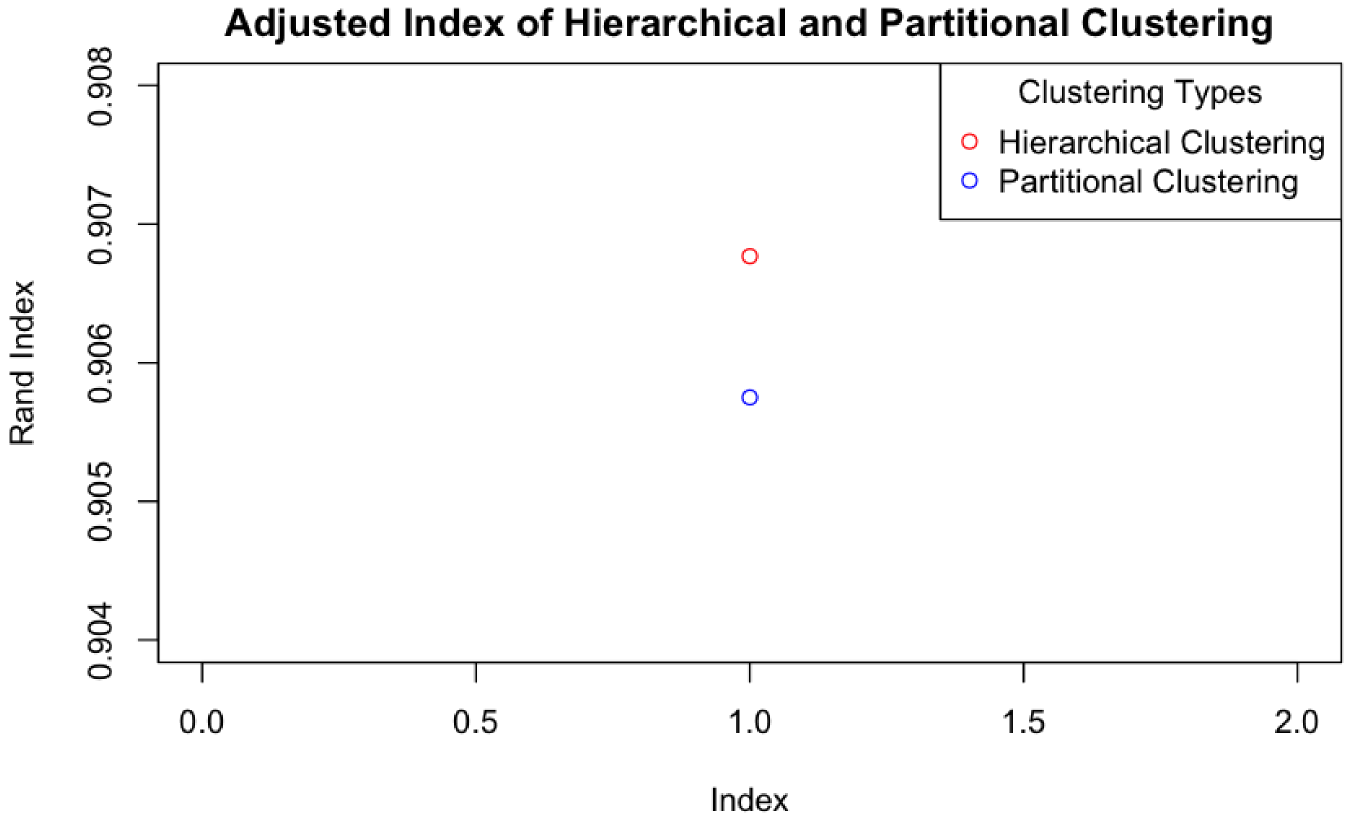
```
par(new=TRUE)


points(unadjusted_hier, col='red')
```

Hide

```
points(unadjusted_par,col='blue')
```


Adjusted Index of Hierarchical and Partitional Clustering
Clustering Types
Hierarchical Clustering
Partitional Clustering
Rand Index
0.904
0.905
0.906
0.907
0.908
0.0
0.5
1.0
1.5
2.0
Index

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```
NA
NA
```