Date: 18/Jan/2024 EXPERIMENT – 02	HIERARCHICAL CLUSTERING

AIM: To perform hierarchical clustering

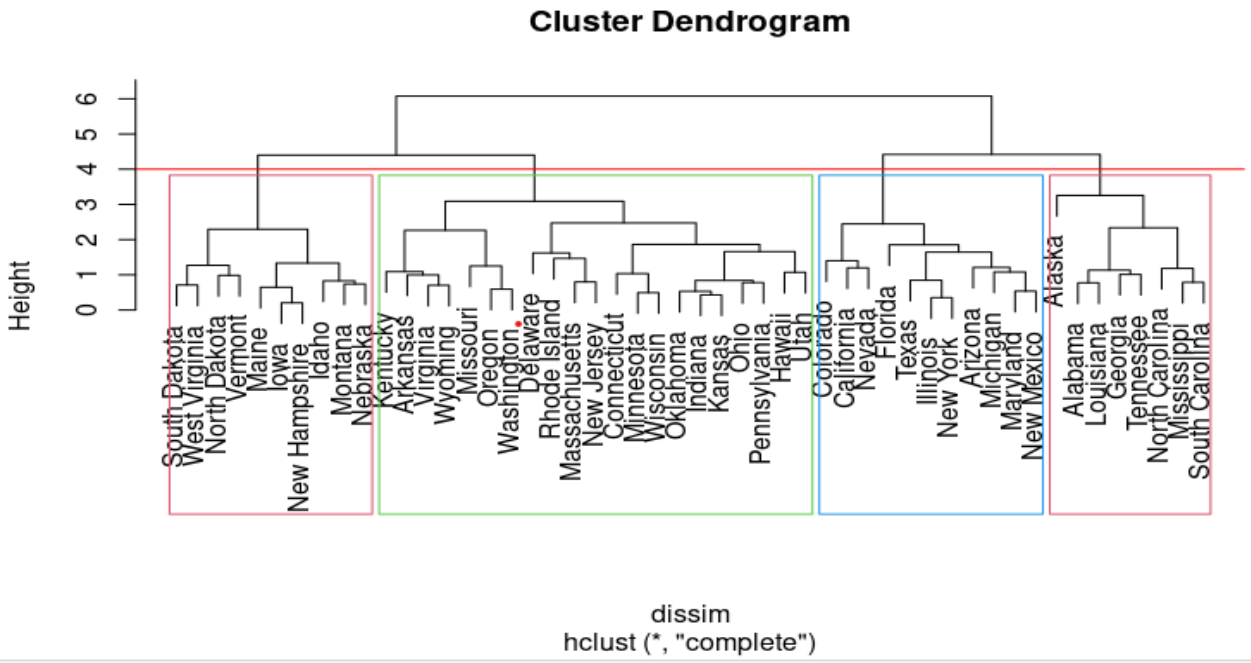
SOFTWARE REQUIRED: RStudio

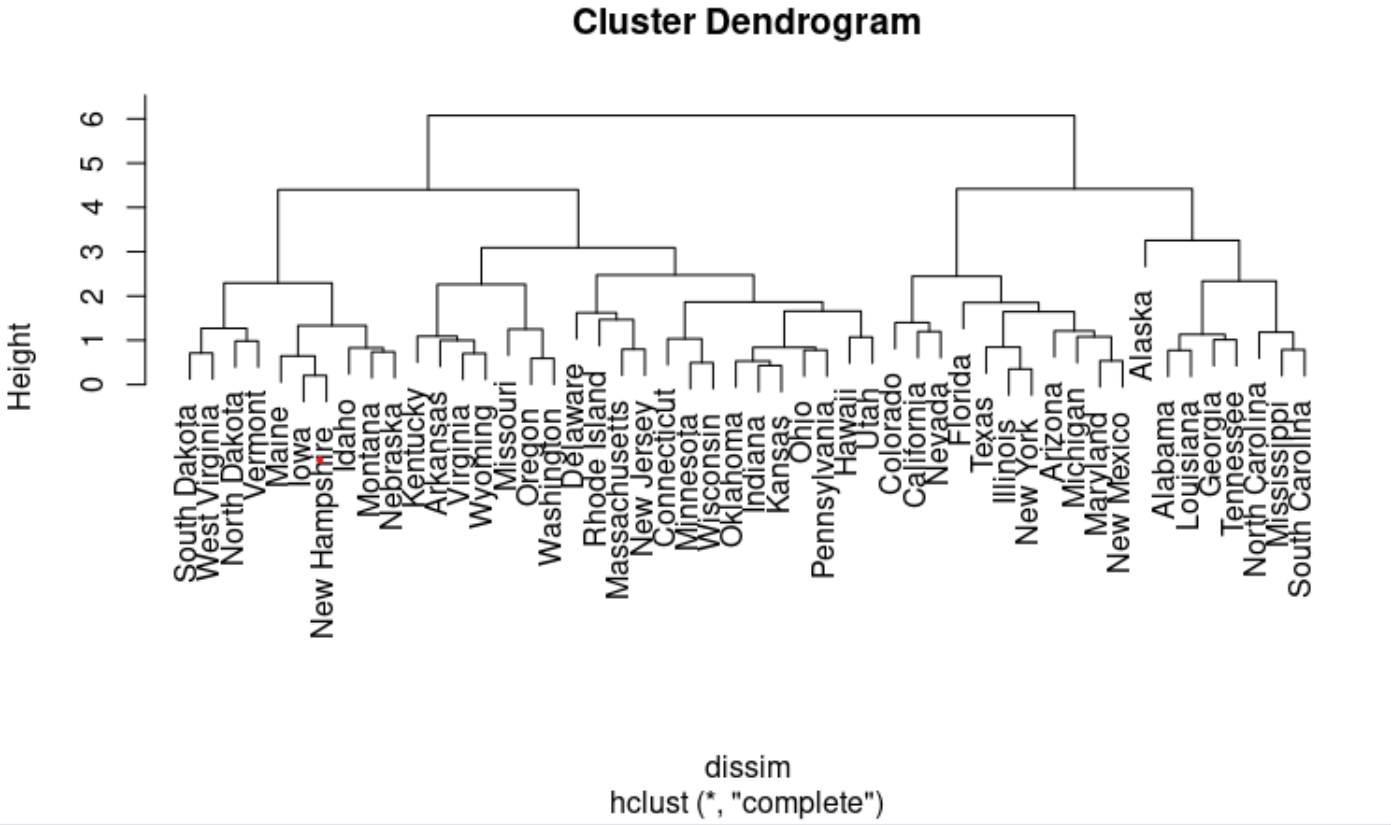
R CODE:

```
rm(list=ls())
data<-read.csv("USArrests.csv",row.names=1)
df
df<-scale(data)
dissim<-dist(df,method='euclidean')
hierClust<-hclust(dissim,method='complete')
plot(hierClust)

cluster<-cutree(hierClust,k=4)

library(clValid)

dunn(dissim,cluster)

rect.hclust(hierClust,k=4,border=2:4)

abline(h=4,col='red')
```

OUTPUT:

```
> rm(list=ls())
> data<-read.csv("USArrests.csv",row.names=1)
> df
function (x, df1, df2, ncp, log = FALSE)
{
    if (missing(ncp))
        .Call(C_df, x, df1, df2, log)
    else .Call(C_dnf, x, df1, df2, ncp, log)
}
<bytecode: 0x55f96c5e6100>
<environment: namespace:stats>
> df<-scale(data)
> dissim<-dist(df,method='euclidean')
> hierClust<-hclust(dissim,method='complete')
> plot(hierClust)
>
> cluster<-cutree(hierClust,k=4)
>
> library(clValid)
>
> dunn(dissim,cluster)
[1] 0.1621625
>
> rect.hclust(hierClust,k=4,border=2:4)
>
> abline(h=4,col='red')
>
```


Cluster Dendrogram
Height
0 1 2 3 4 5 6
South Dakota
West Virginia
North Dakota
Vermont
Maine
Iowa
New Hampshire
Idaho
Montana
Nebraska
Kentucky
Arkansas
Virginia
Wyoming
Missouri
Oregon
Washington
Delaware
Rhode Island
Massachusetts
New Jersey
Connecticut
Minnesota
Wisconsin
Oklahoma
Indiana
Kansas
Ohio
Pennsylvania
Hawaii
Utah
Colorado
California
Nevada
Florida
Texas
Illinois
New York
Arizona
Michigan
Maryland
New Mexico
Alaska
Alabama
Louisiana
Georgia
Tennessee
North Carolina
Mississippi
South Carolina
dissim
hclust (*, "complete")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Rhode Island
Massachusetts
New Jersey
Connecticut
Minnesota
Wisconsin
Oklahoma
Indiana
Kansas
Ohio
Pennsylvania
Hawaii
Utah
Colorado
California
Nevada
Florida
Texas
Illinois
New York
Arizona
Michigan
Maryland
New Mexico
Alaska
Alabama
Louisiana
Georgia
Tennessee
North Carolina
Mississippi
South Carolina
dissim
hclust (*, "complete")