Cluster Analysis

```
# Load dataset
data("USArrests")
df <- USArrests
row.names(data)<-c(df$X)
head(df)
```

	Murder	Assault	UrbanPop	Rape
Alabama	13.2	236	58	21.2
Alaska	10.0	263	48	44.5
Arizona	8.1	294	80	31.0
Arkansas	8.8	190	50	19.5
California	9.0	276	91	40.6
Colorado	7.9	204	78	38.7

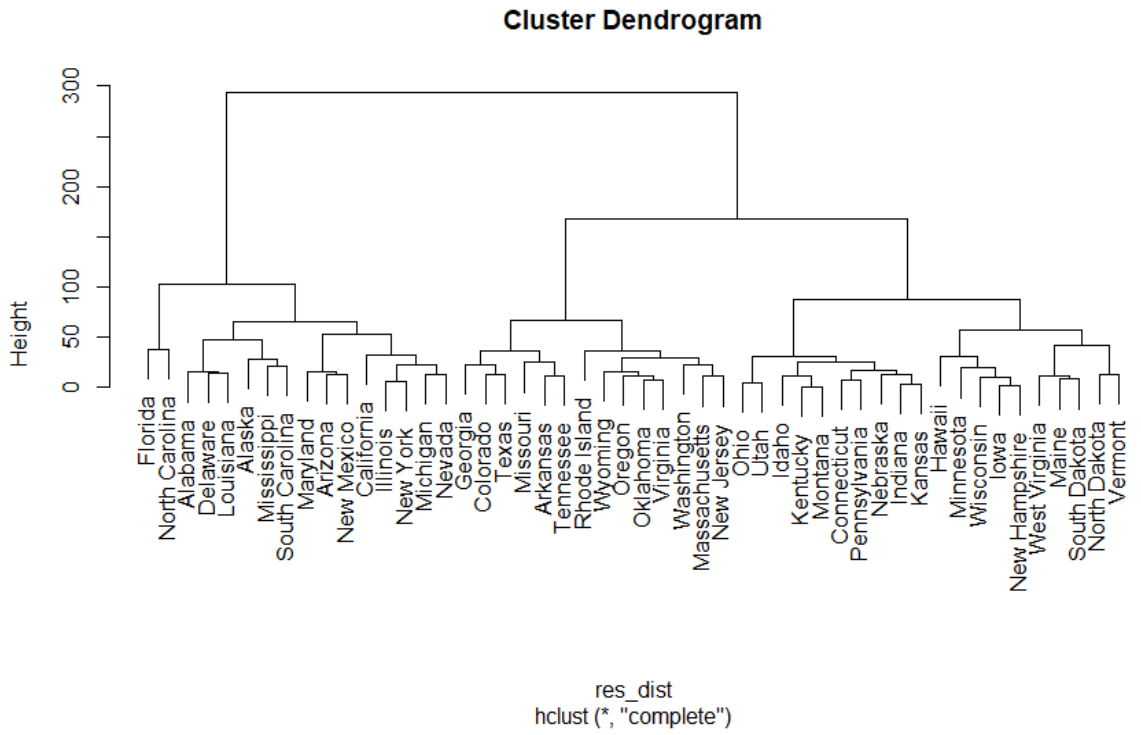
```
df<-df[,-1]
View(df)
head(df)
```

	Assault	UrbanPop	Rape
Alabama	236	58	21.2
Alaska	263	48	44.5
Arizona	294	80	31.0
Arkansas	190	50	19.5
California	276	91	40.6
Colorado	204	78	38.7

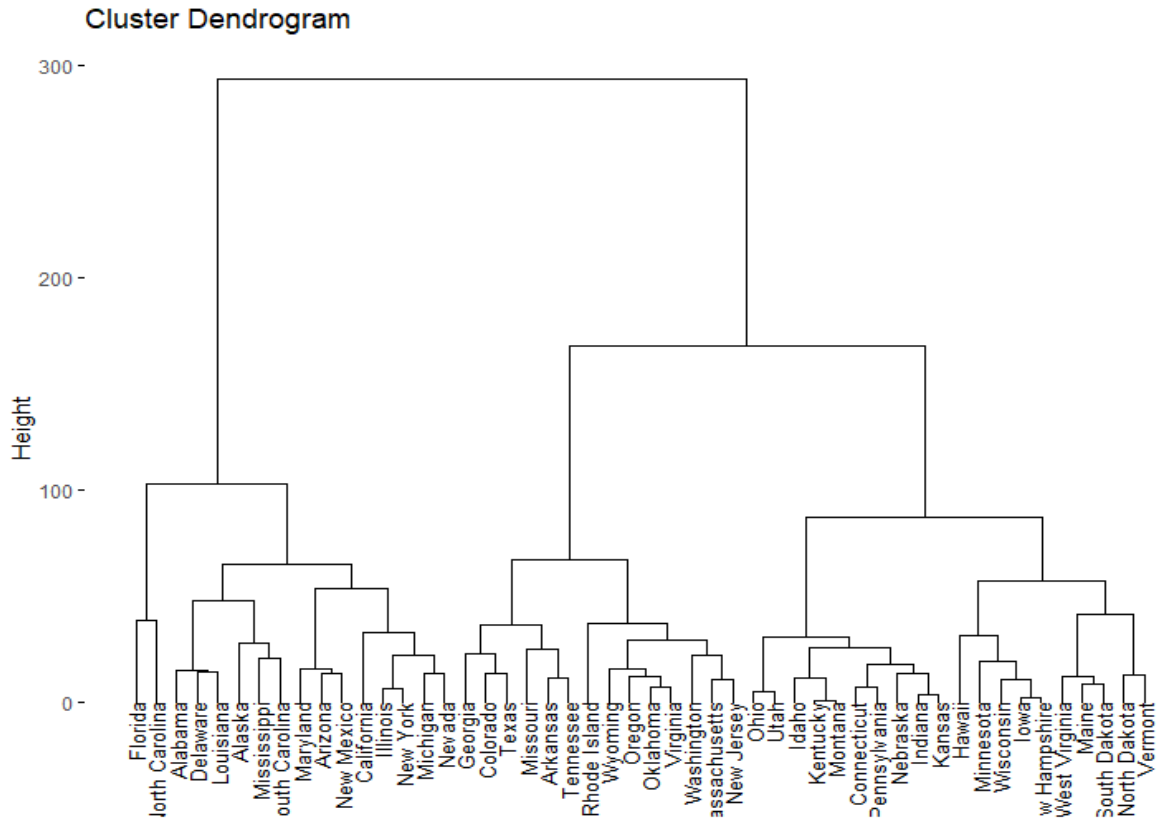
```
df<-na.omit(df)

require(stats)

res_dist<-dist(x=df,method = "euclidean")

x<-as.matrix(res_dist)[1:6,1:6]

x

round(x,digits = 3)
```

	Alabama	Alaska	Arizona	Arkansas	California	Colorado
Alabama	0.000	37.039	62.802	46.721	55.366	41.596
Alaska	37.039	0.000	46.554	77.188	45.091	66.443
Arizona	62.802	46.554	0.000	108.850	23.177	90.351
Arkansas	46.721	77.188	108.850	0.000	97.582	36.724
California	55.366	45.091	23.177	97.582	0.000	73.189
Colorado	41.596	66.443	90.351	36.724	73.189	0.000

```
require(stats)

res.hc<-hclust(d=res_dist,method = "complete")

plot(x=res.hc)
```




```
require(factoextra)
fviz_dend(x=res.hc,cex = 0.7,lwd = 0.7)
```



```
require(grDevices)
colors()
require(scales)
palette()
show_col(palette(rainbow(6)))
require(ggsci)
show_col(pal_jco(palette = c("default"))(10))
show_col(pal_jco("default",alpha = 0.6)(10))
fviz_dend(x=res.hc,cex=0.8,lwd=0.8,k=4,k_colors = c("red","green3","blue","magenta")
          ,ggtheme = theme_void() )
```