Data Reading

Tobacco2<-read.table("D:/cscd477/assignment4/data/Youth_Tobacco_Survey__YTS__Data.csv", header=TRUE, sep=",",quote="\"")

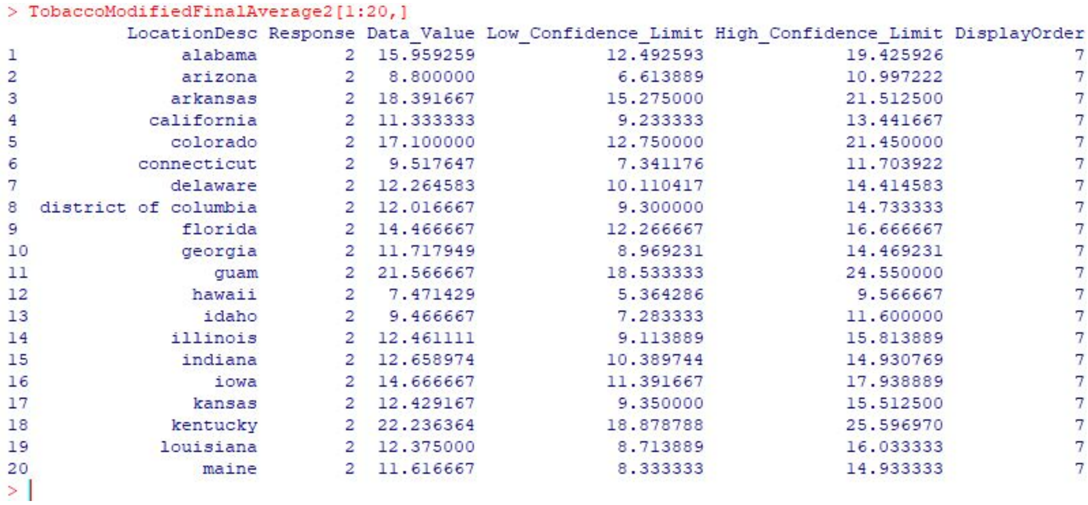
Data cleaning:

TobaccoModified2<-Tobacco2[Tobacco2$Response=="Current" & Tobacco2$DisplayOrder==7,]

TobaccoModifiedFinal2<-TobaccoModified2[,c("LocationDesc","Response","Data_Value","Low_Confidence_Limit","High_Confidence_Limit","DisplayOrder")]

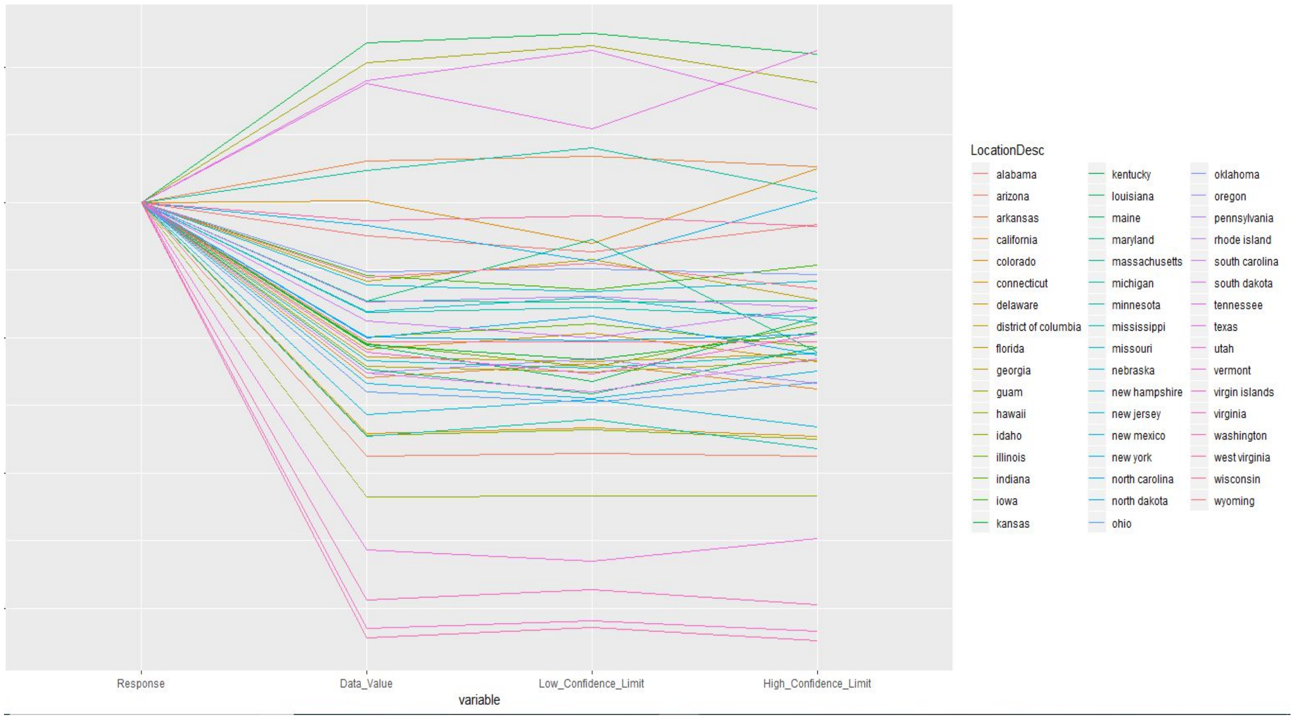
TobaccoModifiedFinalAverage2<-aggregate(.~LocationDesc,data=TobaccoModifiedFinal2,FUN=mean)

TobaccoModifiedFinalAverage2$LocationDesc<-tolower(TobaccoModifiedFinalAverage2$LocationDesc)



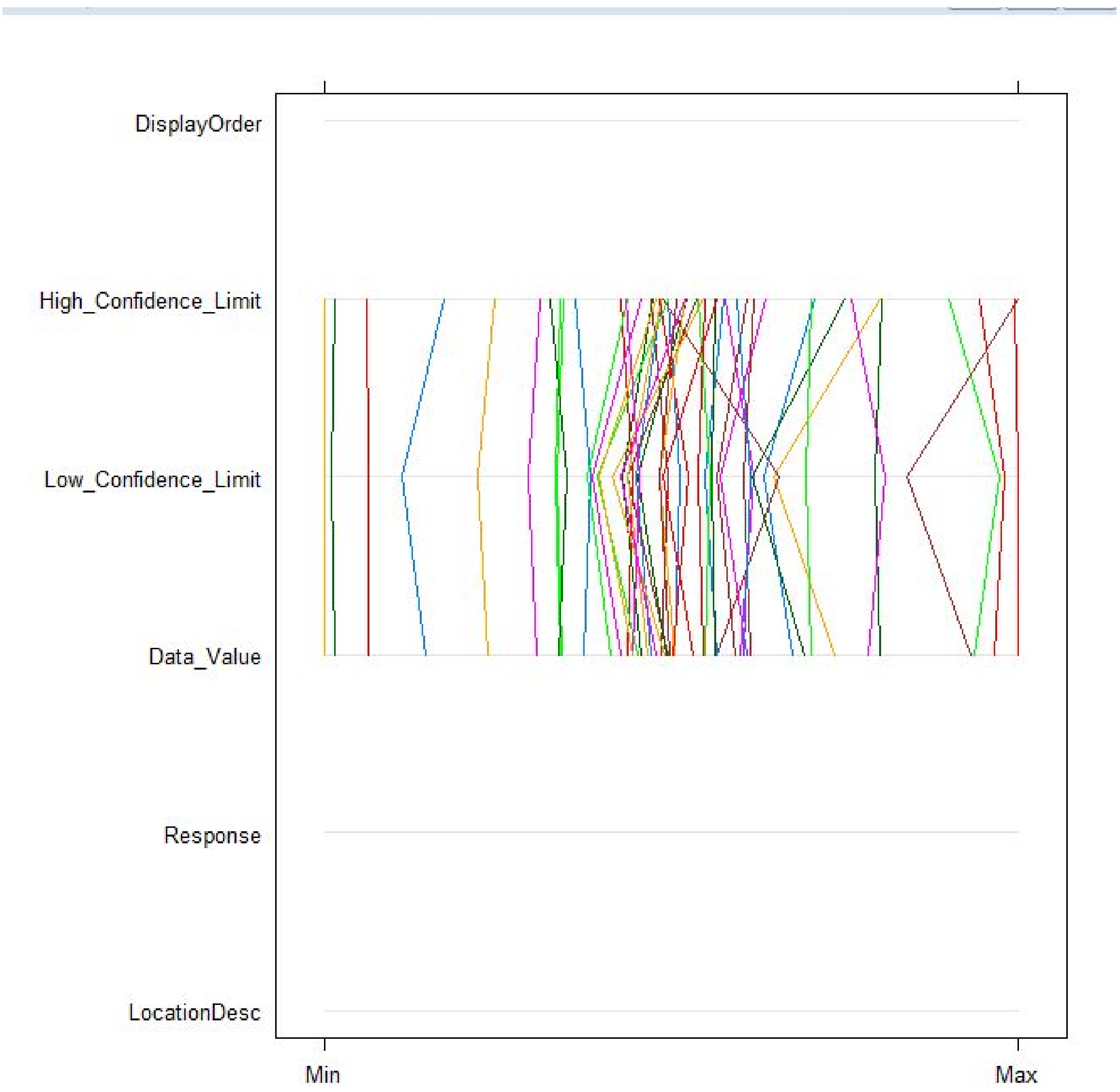
```
> TobaccoModifiedFinalAverage2[1:20,]
           LocationDesc Response Data_Value Low_Confidence_Limit High_Confidence_Limit DisplayOrder
1               alabama        2  15.959259            12.492593             19.425926            7
2               arizona        2   8.800000             6.613889             10.997222            7
3              arkansas        2  18.391667            15.275000             21.512500            7
4            california        2  11.333333             9.233333             13.441667            7
5              colorado        2  17.100000            12.750000             21.450000            7
6           connecticut        2   9.517647             7.341176             11.703922            7
7              delaware        2  12.264583            10.110417             14.414583            7
8  district of columbia        2  12.016667             9.300000             14.733333            7
9               florida        2  14.466667            12.266667             16.666667            7
10              georgia        2  11.717949             8.969231             14.469231            7
11                 guam        2  21.566667            18.533333             24.550000            7
12               hawaii        2   7.471429             5.364286              9.566667            7
13                idaho        2   9.466667             7.283333             11.600000            7
14             illinois        2  12.461111             9.113889             15.813889            7
15              indiana        2  12.658974            10.389744             14.930769            7
16                 iowa        2  14.666667            11.391667             17.938889            7
17               kansas        2  12.429167             9.350000             15.512500            7
18             kentucky        2  22.236364            18.878788             25.596970            7
19            louisiana        2  12.375000             8.713889             16.033333            7
20                maine        2  11.616667             8.333333             14.933333            7
> 
```

ggparcoord(TobaccoModifiedFinalAverage2, columns = 2:5, groupColumn= "LocationDesc", title="Youth Tobacco Survey")

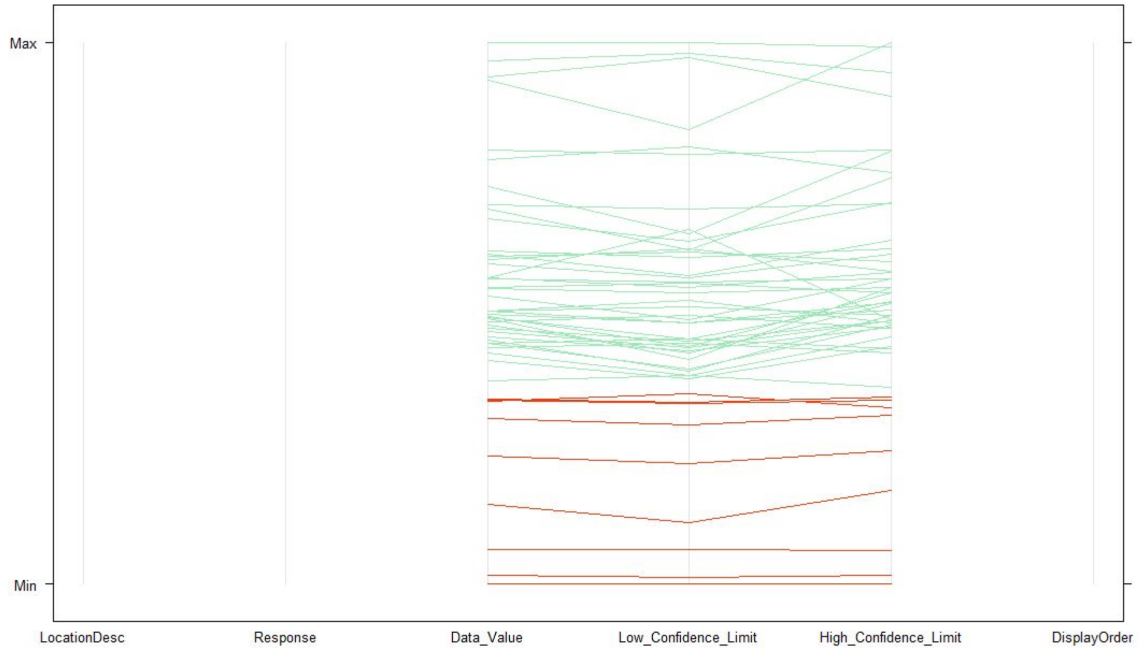


Making Clusters:

```
parallelplot(TobaccoModifiedFinalAverage2)
```



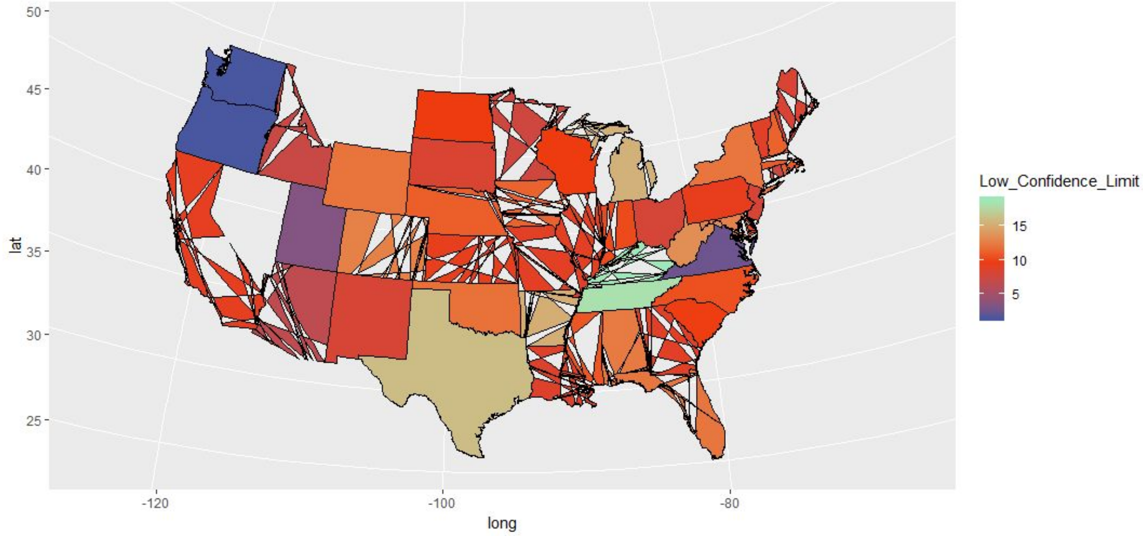
```
reading_colors<-c()

for (i in 1:length(TobaccoModifiedFinalAverage2$LocationDesc)){if
(TobaccoModifiedFinalAverage2$Data_Value[i] > 10){col<-"#9fe9b9"}else{col<-"#ef3b10"   }

reading_colors<-c(reading_colors, col)}

parallelplot(TobaccoModifiedFinalAverage2, horizontal.axis=FALSE, col=reading_colors)
```



```
TobaccoAverageMap2<-merge(states_map,TobaccoModifiedFinalAverage2, by.x="region",
by.y="LocationDesc")
```

```
ggplot(TobaccoAverageMap2, aes(x=long, y=lat, group=group,
fill=Low_Confidence_Limit))+geom_polygon(colour="black")+coord_map("polyconic")
```

```
ggplot(TobaccoAverageMap2, aes(x=long, y=lat   , group=group,
fill=Low_Confidence_Limit))+geom_polygon(colour="black")+scale_fill_gradient2(low="#2158aa
",mid="#ef3b10",
high="#9fe9b9",midpoint=median(TobaccoModifiedFinalAverage2$Low_Confidence_Limit)) +
coord_map("polyconic")
```



Conclusion:

For this Tobacco Survey, we can make relationship with each variables by paraller plot. With pararllel plot we can easily compare each state. Correlations can be observed as states are plotted on the chart. Each state corresponds to a line drawn through point on each axis corresponding to the value of the variable.

Yes, Clustering help in visualizing information. For exapmle, In this information, if the Data_value is more than 10 then the color is greenish and if less than 10 then the color is redish.