freedom

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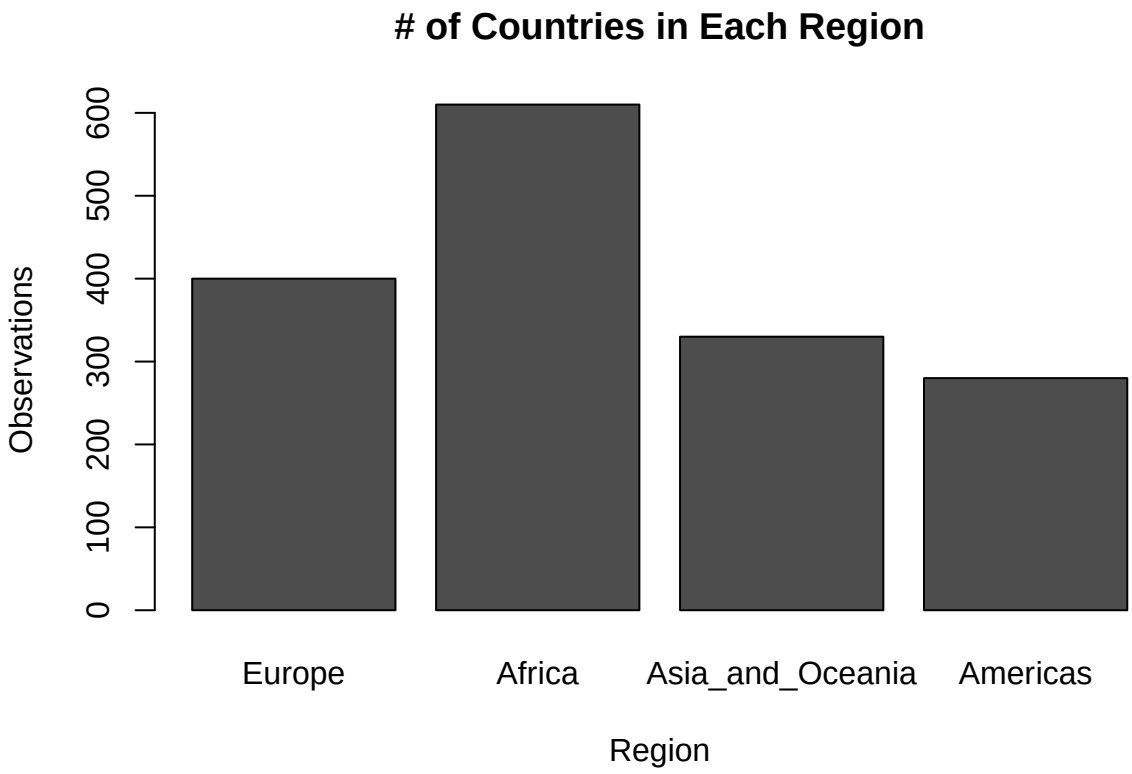
1/21/2020

Read in data and split into groups

```
data<-read.csv("hfi_cc_2019.csv")

#find the number of "-"'s in the row pf_rol_procedural
#sum(data$pf_rol_procedural=="-")

#number of observations for each region
#summary(data$region)

#add a region column to the data
data<-cbind(data.frame("REGION" = numeric(nrow(data))),data)
for(i in 1:nrow(data)){
  if (data$region[i]=="South Asia"|
      data$region[i]=="Caucasus & Central Asia"|
      data$region[i]=="Oceania"|
      data$region[i]=="East Asia"){
    data$REGION[i]<-"asia_oceania"
  } else if (data$region[i]=="Eastern Europe"|
             data$region[i]=="Western Europe") {
    data$REGION[i]<-"europe"
  } else if (data$region[i]=="Middle East & North Africa"|
             data$region[i]=="Sub-Saharan Africa") {
    data$REGION[i]<-"africa"
  } else if (data$region[i]=="North America"|
             data$region[i]=="Latin America & the Caribbean") {
    data$REGION[i]<-"americas"
  }
}

#split the data into groups
asia_oceania<-data[data$region=="South Asia"|
                     data$region=="Caucasus & Central Asia"|
                     data$region=="Oceania"|
                     data$region=="East Asia",]
europe<-data[data$region=="Eastern Europe"|
             data$region=="Western Europe",]
africa<-data[data$region=="Middle East & North Africa"|
             data$region=="Sub-Saharan Africa",]
americas<-data[data$region=="North America"|
               data$region=="Latin America & the Caribbean",]
```

Make a barplot of number of observations in each category

```
mydf<-data.frame(Europe=nrow(europe), Africa=nrow(africa),
                 Asia_and_Oceania=nrow(asia_oceania), Americas=nrow(americas))
barplot(t(t(as.matrix(mydf))), main="# of Countries in Each Region",
        ylab="Observations", xlab="Region")
```



Plot histograms, densities, and boxplots for the continuous variables (hf_score, ef_score, pf_score)

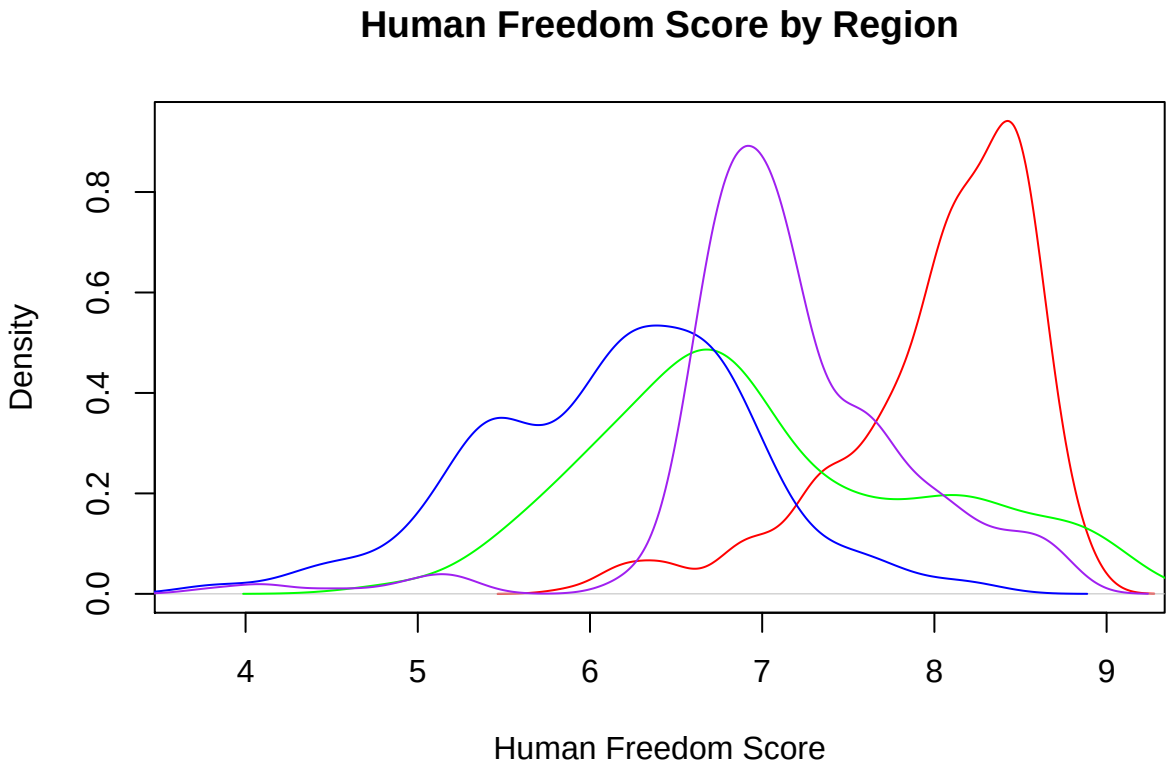
function code

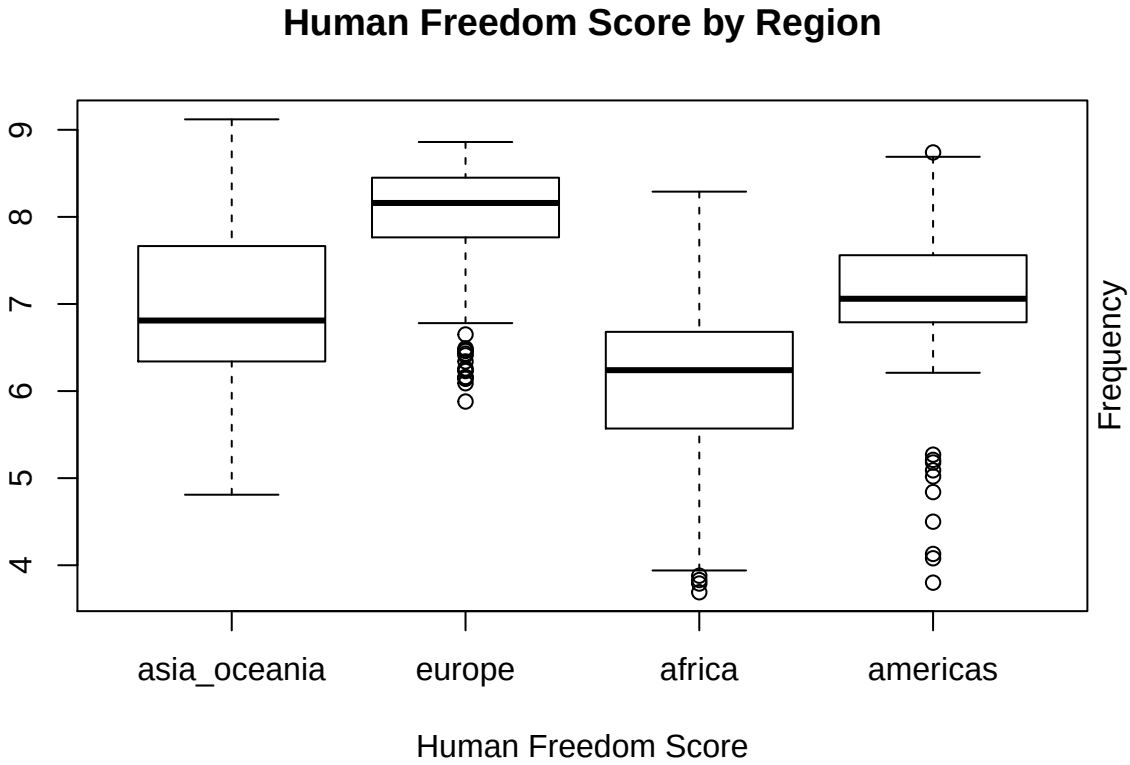
```
#see code chunk below for examples
#l is a list of vectors
#var is the variable name (for plot title purposes)
cont_plot<-function(l, var) {
  #remove the dashes (missing data) from all regions
  asia_<-as.numeric(as.character(l[[1]][l[[1]]!="-"]))
  europe_<-as.numeric(as.character(l[[2]][l[[2]]!="-"]))
  africa_<-as.numeric(as.character(l[[3]][l[[3]]!="-"]))
  americas_<-as.numeric(as.character(l[[4]][l[[4]]!="-"]))

  #density
  min<-min(c(asia_,europe_,africa_,americas_))
  max<-max(c(asia_,europe_,africa_,americas_))
  plot(density(europe_),xlim=c(min,max), col="red",
       main=paste(var, "by Region"), xlab=var)
  #legend(1,95,legend=c("Europe","Asia_Oceania","Africa","Americas"),
```

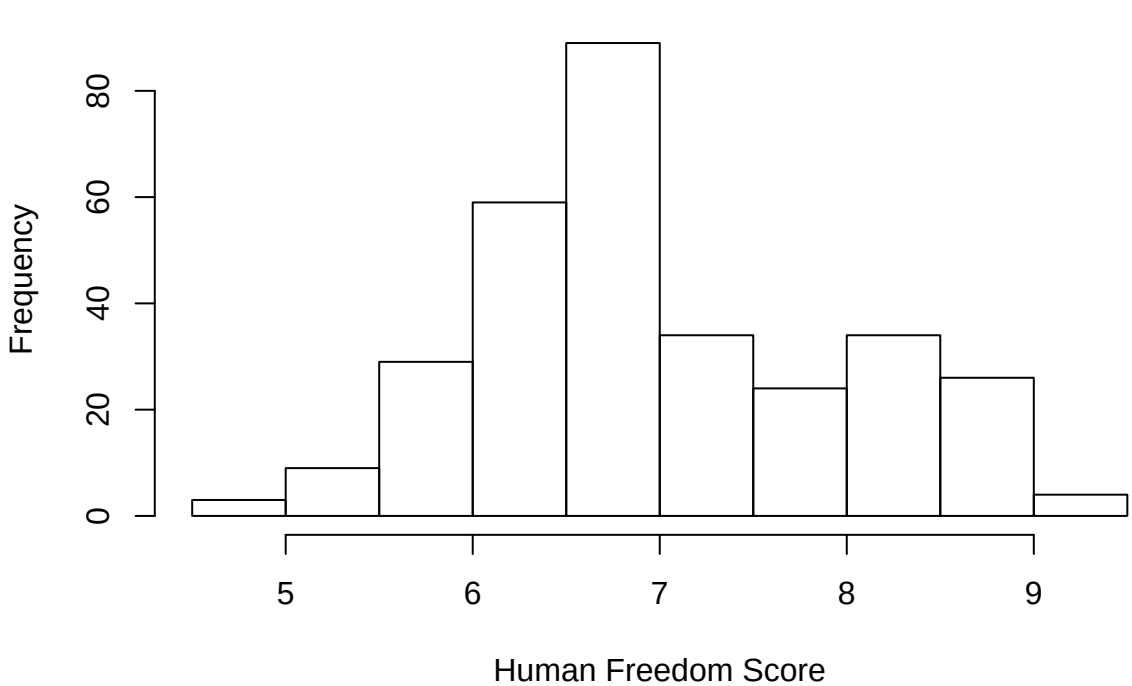
```
  #       fill=c("red","green","blue","purple"))
  lines(density(asia_),col="green")
  lines(density(africa_), col = "blue")
  lines(density(americas_), col = "purple")
  #legend(1, 95, legend=c("Line 1", "Line 2"),
  #     col=c("red", "blue"), lty=1:2, cex=0.8)

  #boxplot
  boxplot(asia_,europe_,africa_,americas_,
          names = c("asia_oceania","europe","africa","americas"),
          main=paste(var, "by Region"), xlab=var)

  #histogram
  hist(europe_, main = paste("Europe",var), xlab=var)
  hist(asia_, main = paste("Asia and Oceania",var), xlab=var)
  hist(africa_, main = paste("Africa",var), xlab=var)
  hist(americas_, main = paste("Americas",var), xlab=var)
}
```

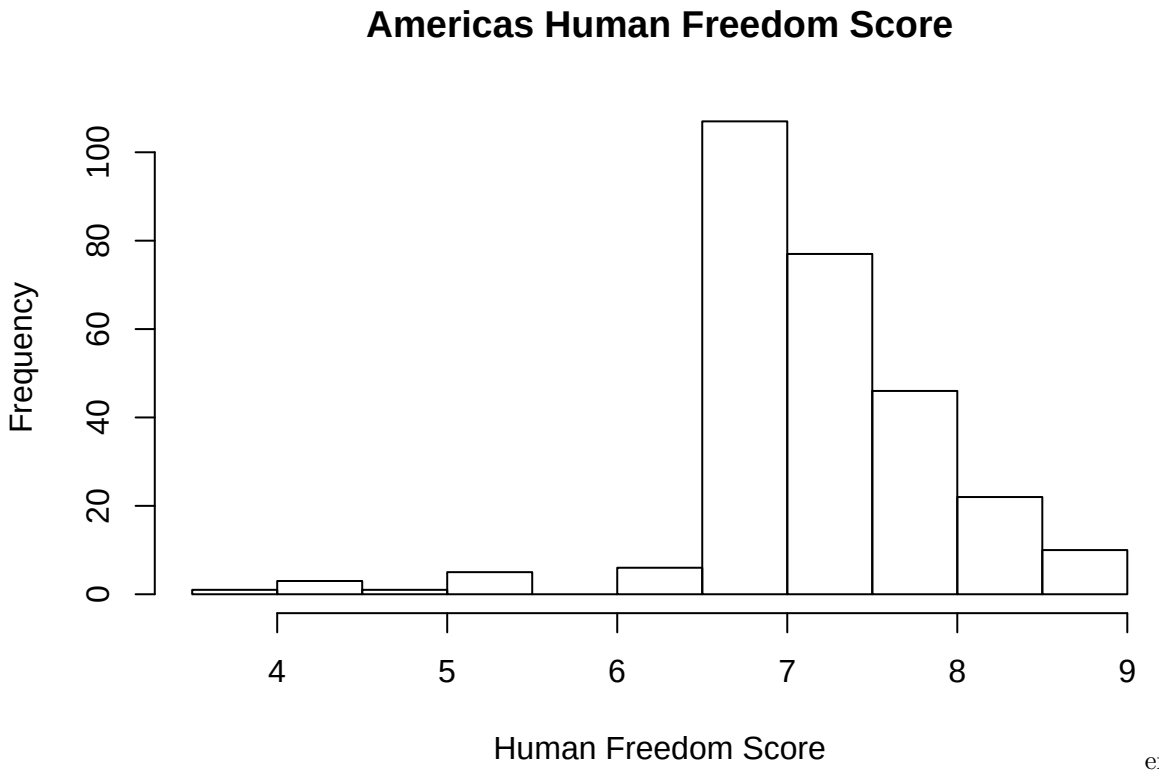
hf_score

```
l<-list(asia_oceania$hf_score,europe$hf_score,africa$hf_score,americas$hf_score)
cont_plot(l, "Human Freedom Score")
```



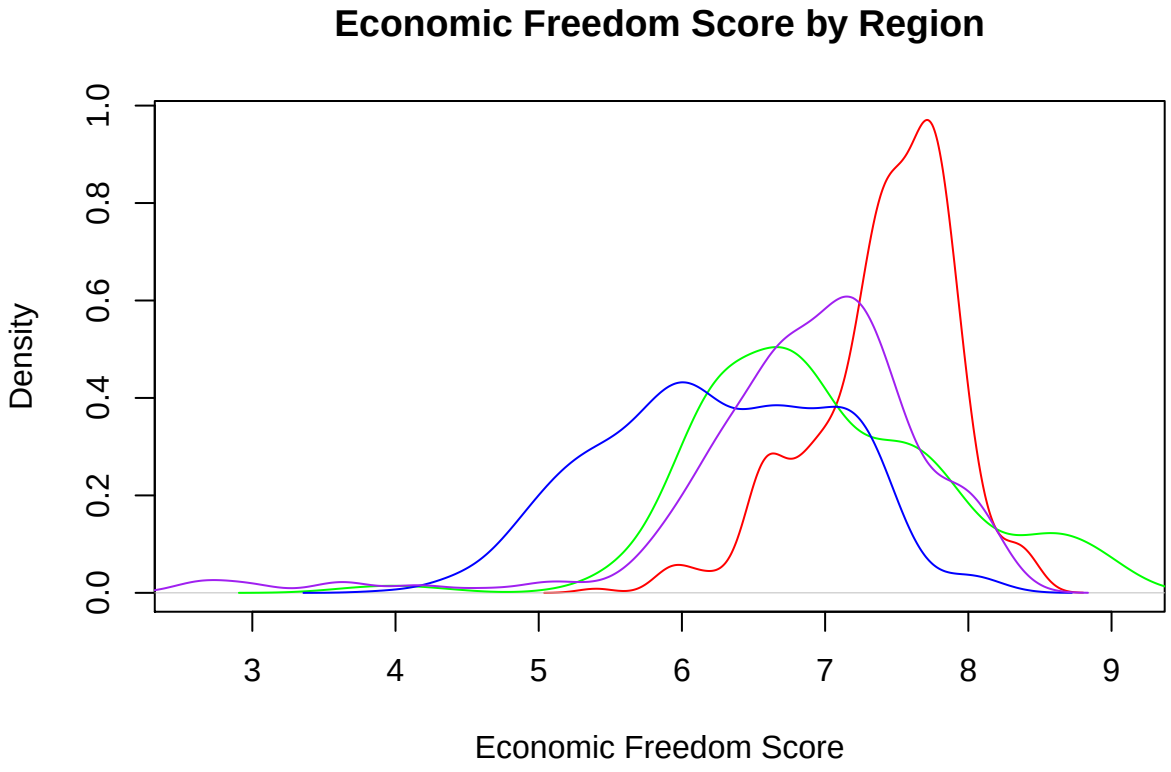

Human Freedom Score by Region
4
5
6
7
8
9
asia_oceania
europe
africa
americas
Human Freedom Score
Frequency
0
50
100
150
5.5
6.0

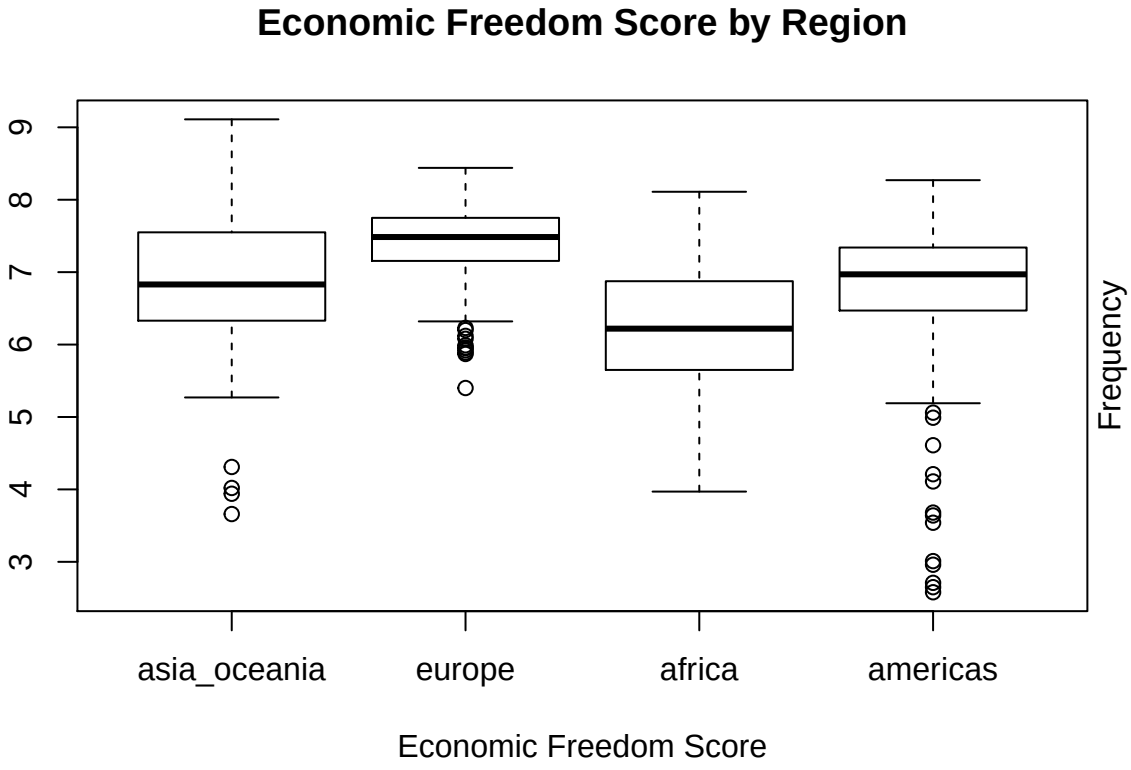

Asia and Oceania Human Freedom Score
Frequency
0
20
40
60
80
5
6
7
8
9
Human Freedom Score
Frequency
0
50
100
150
4

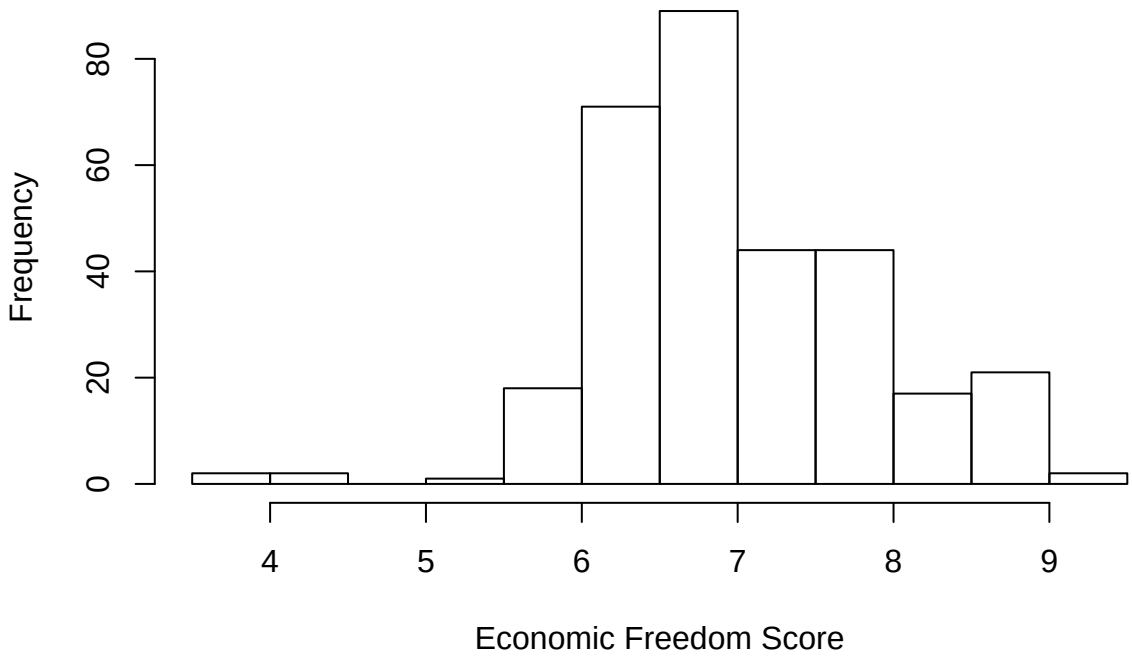


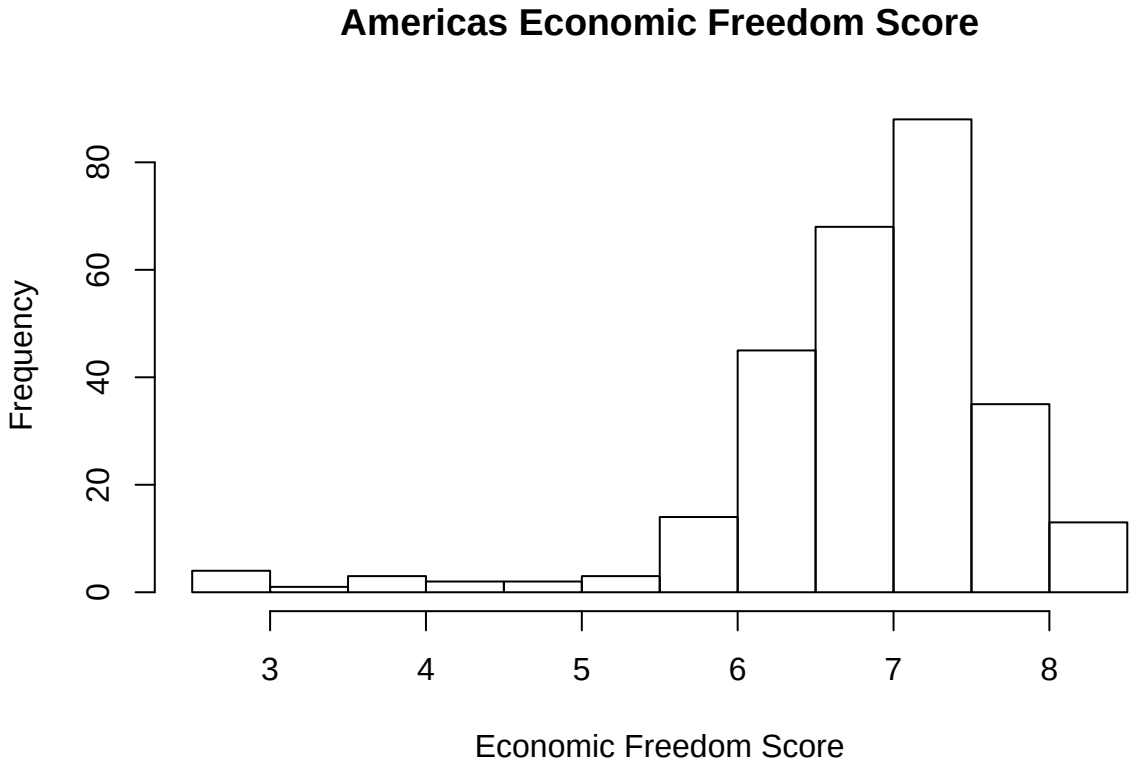
ef_score

```
l<-list(asia_oceania$ef_score,europe$ef_score,africa$ef_score,americas$ef_score)
cont_plot(l, "Economic Freedom Score")
```



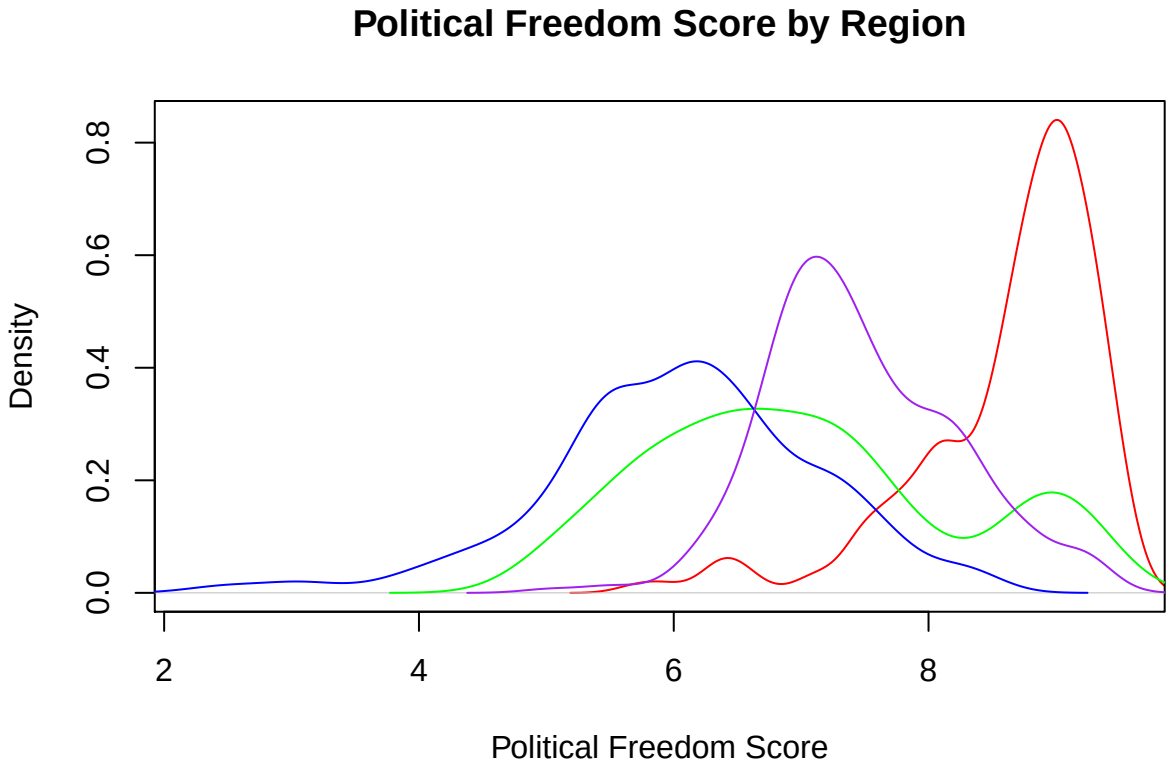

Economic Freedom Score by Region
3
4
5
6
7
8
9
asia_oceania
europe
africa
americas
Economic Freedom Score
Frequency
0
50
100
150
5.0
5.5

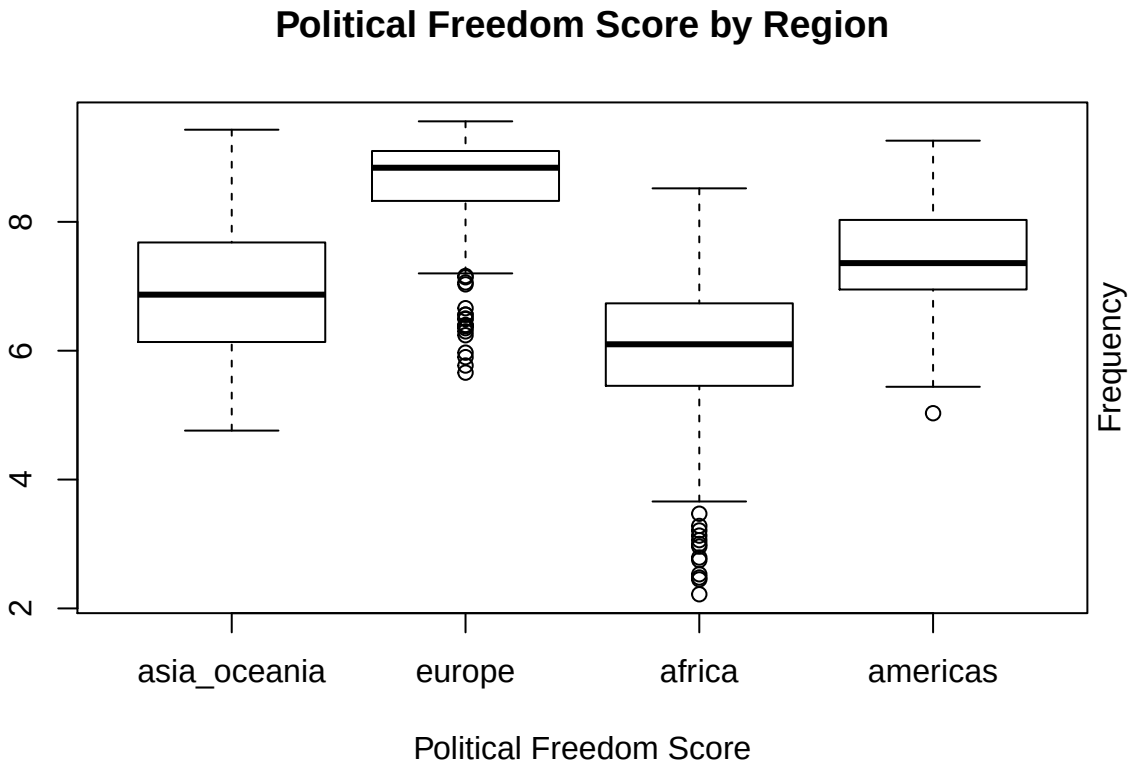

Asia and Oceania Economic Freedom Score
Frequency
0
20
40
60
80
4
5
6
7
8
9
Economic Freedom Score
Frequency
0
20
40
60
80
100
4

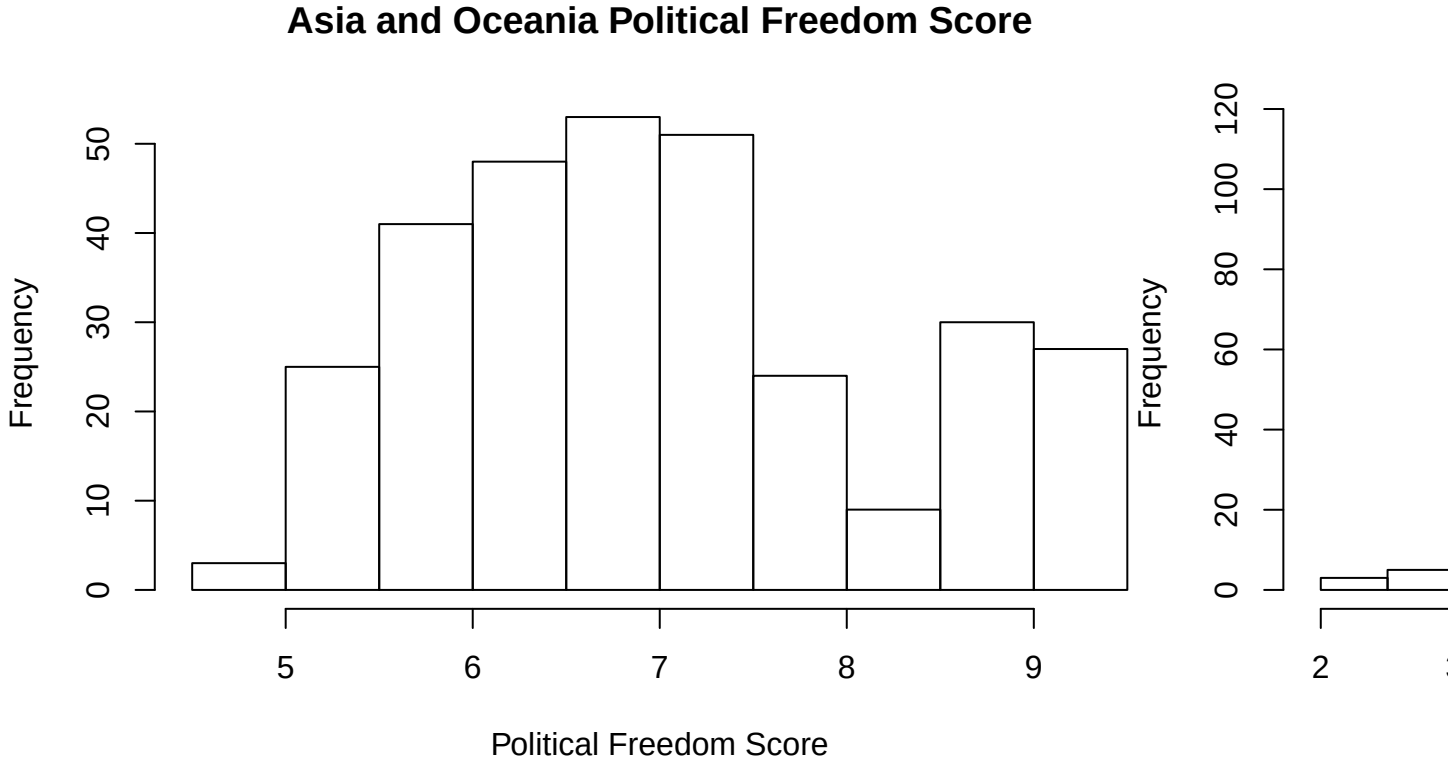


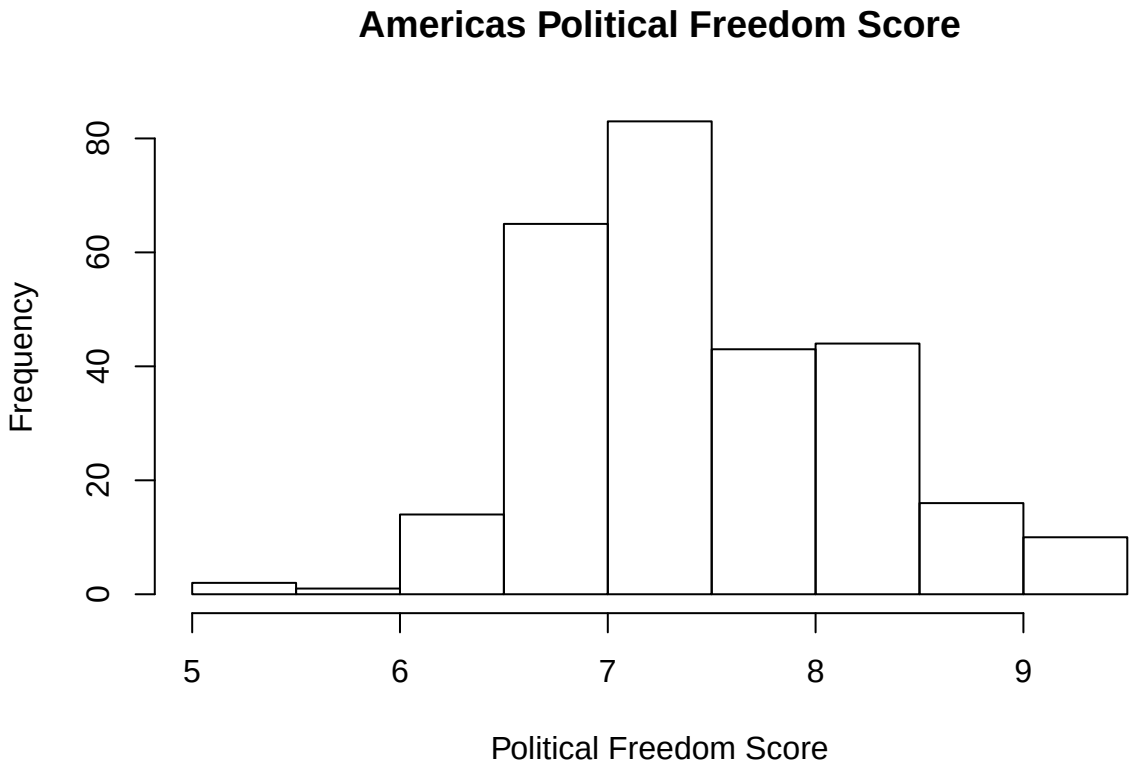
pf_score

```
l<-list(asia_oceania$pf_score,europe$pf_score,africa$pf_score,americas$pf_score)
cont_plot(l, "Political Freedom Score")
```

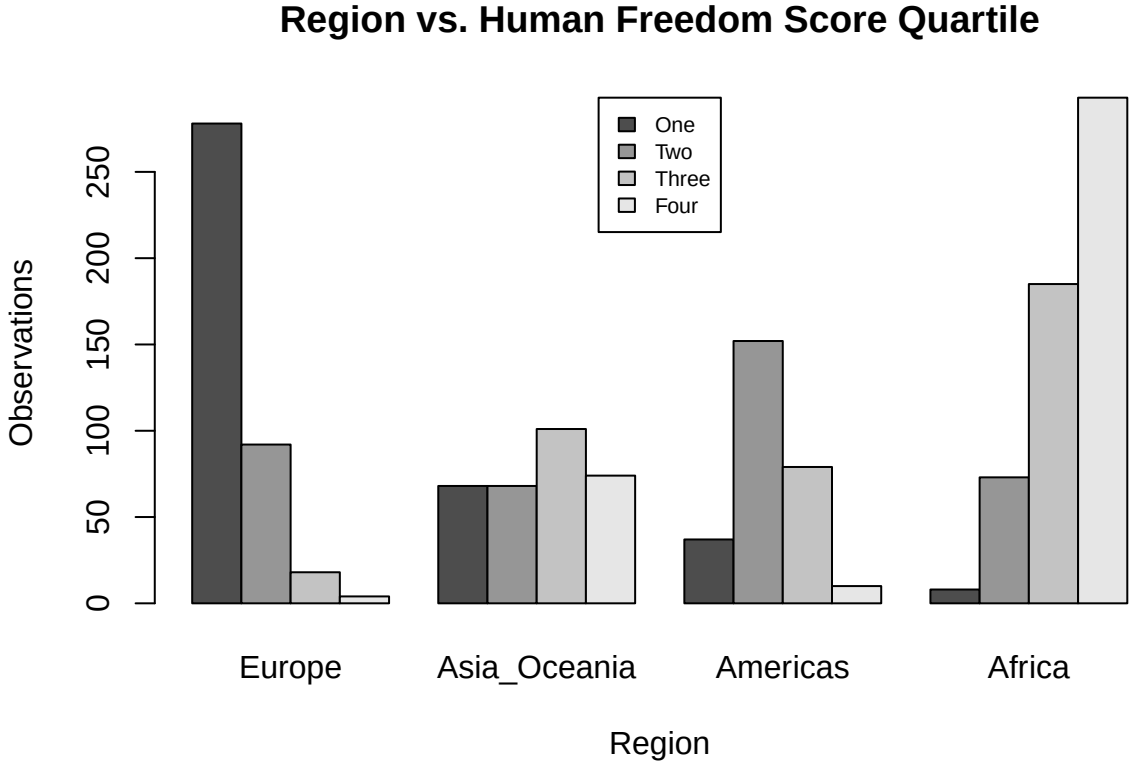


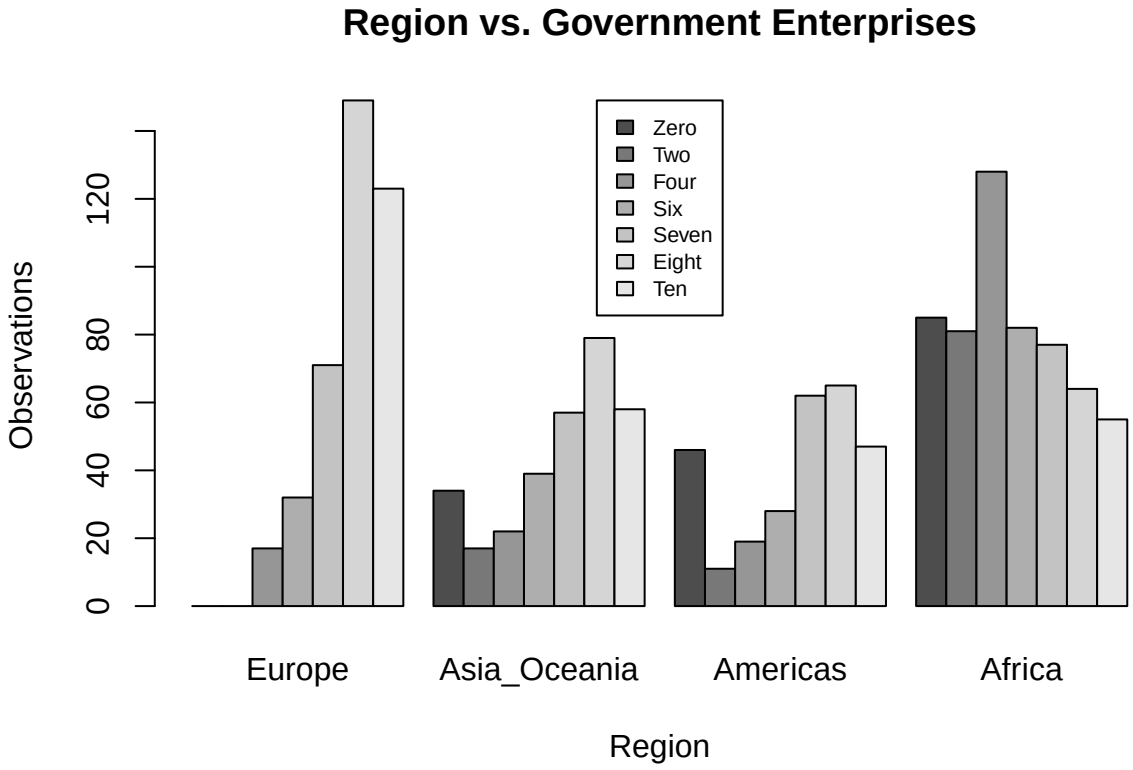

Political Freedom Score by Region
2
4
6
8
asia_oceania
europe
africa
americas
Political Freedom Score
Frequency
0
20
40
60
80
120
6


Asia and Oceania Political Freedom Score
Frequency
0
10
20
30
40
50
5
6
7
8
9
Political Freedom Score
Frequency
0
20
40
60
80
100
120
2



Plot bar plots for the discrete variables (ef_government_enterprises, ef_government, year, hf_quartile)




Region vs. Government Enterprises
Zero
Two
Four
Six
Seven
Eight
Ten
Observations
0
20
40
60
80
120
Europe
Asia_Oceania
Americas
Africa
Region