

# Problem Set 2

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2017-10-11

## Problem 1

a. There are 250 assassination attempts recorded in the data.

```
leaders <- read.csv("https://raw.githubusercontent.com/kosukeimai/qss/master/CAUSALITY/leaders.csv")
nrow(leaders)
```

```
## [1] 250
```

b. There are 88 different countries with an assassination attempt in the dataset.

```
length(unique(leaders$country))
```

```
## [1] 88
```

c. Success, binary variable

```
levels(leaders$result)
```

```
## [1] "dies between a day and a week"
## [2] "dies between a week and a month"
## [3] "dies within a day after the attack"
## [4] "dies, timing unknown"
## [5] "hospitalization but no permanent disability"
## [6] "not wounded"
## [7] "plot stopped"
## [8] "survives but wounded severely"
## [9] "survives, whether wounded unknown"
## [10] "wounded lightly"
```

```
leaders$success <- ifelse((leaders$result == "dies between a day and a week" | leaders$result == "dies between a week and a month" | leaders$result == "dies within a day after the attack" | leaders$result == "dies, timing unknown"), 1, 0)
head(leaders$success)
```

```
## [1] 0 1 0 0 0 0
```

d. The “success” rate of leader assassination attempts is 0.2, or 20%

```
mean(leaders$success)
```

```
## [1] 0.216
```

e. Average polity scores

```
tapply(leaders$politybefore, leaders$success, mean)
```

```
##           0           1
## -1.7431973 -0.7037037
```

```
tapply(leaders$politybefore, leaders$success, median)
```

```
##  0  1
## -3 -3
```

f. The success of assassination attempts in this experiment is close to randomly assigned because the medians do not change between successful and unsuccessful attempts.

g. Looking at the mean polity score for the treatment group, the score decreases from -0.7 to -0.76, a very slight shift on the 21 point scale towards -10 (monarchy) and away from 10 (democracy). Based on these results individual leaders do not make a difference in the level of democracy.

```
tapply(leaders$polityafter, leaders$success, mean)
```

```
##           0           1
## -1.8945578 -0.7623457
```

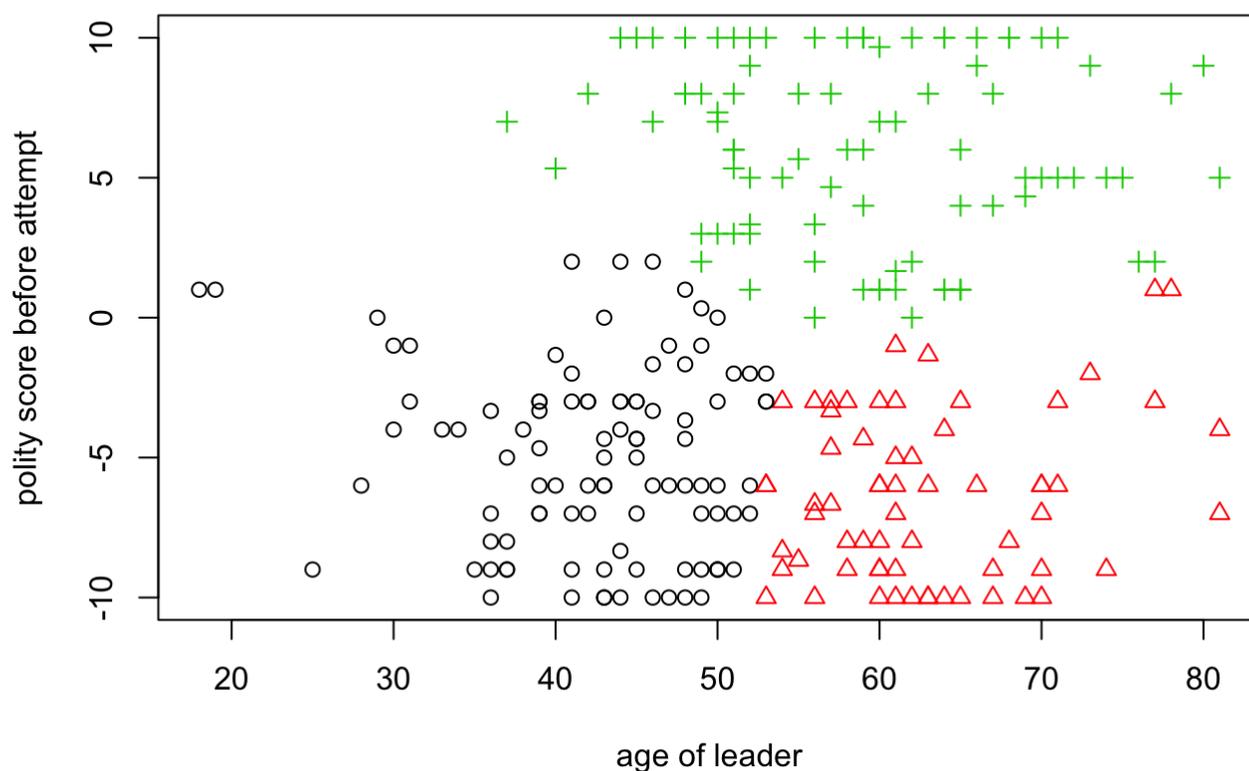
```
tapply(leaders$polityafter, leaders$success, median)
```

```
##  0  1
## -4 -3
```

h. A potential confounder could be the geographic region of the nation. For example, a coup in Europe versus Asia will have different effects on the outcome and on the treatment (leaders) due to historic/regional contexts which can confound the results of the experiment.

i. Bonus:

```
m1 <- as.matrix(leaders$age)
m2 <- as.matrix(leaders$politybefore)
m <- cbind(m1,m2) ## matrix
colnames(m) <- c("age of leader", "polity score before attempt")
m.std <- data.frame(scale(m)) ##standardize
m3 <- kmeans(m.std, centers = 3) ##kmeans
plot(m, col= m3$cluster, pch= m3$cluster) ##plot clusters
```



The lower left cluster represents leaders under the age of 50 and mostly negative polity scores. The lower right cluster represents leaders over age 50 and negative polity scores. The upper cluster represents leaders between age 40 and 80, with positive polity scores (more democratic). There is not much distinction between the clusters, which means the relationship between the leader's age and the polity score before the assassination attempt is closer to random.

## Problem 2

a. Load data "unvoting"

```
unvoting <- read.csv("https://raw.githubusercontent.com/kosukeimai/qss/master/MEASUREMENT/unvoting.csv")
```

b. The correlation between country ideal points and agreement with the US is 0.75 which is fairly strong.

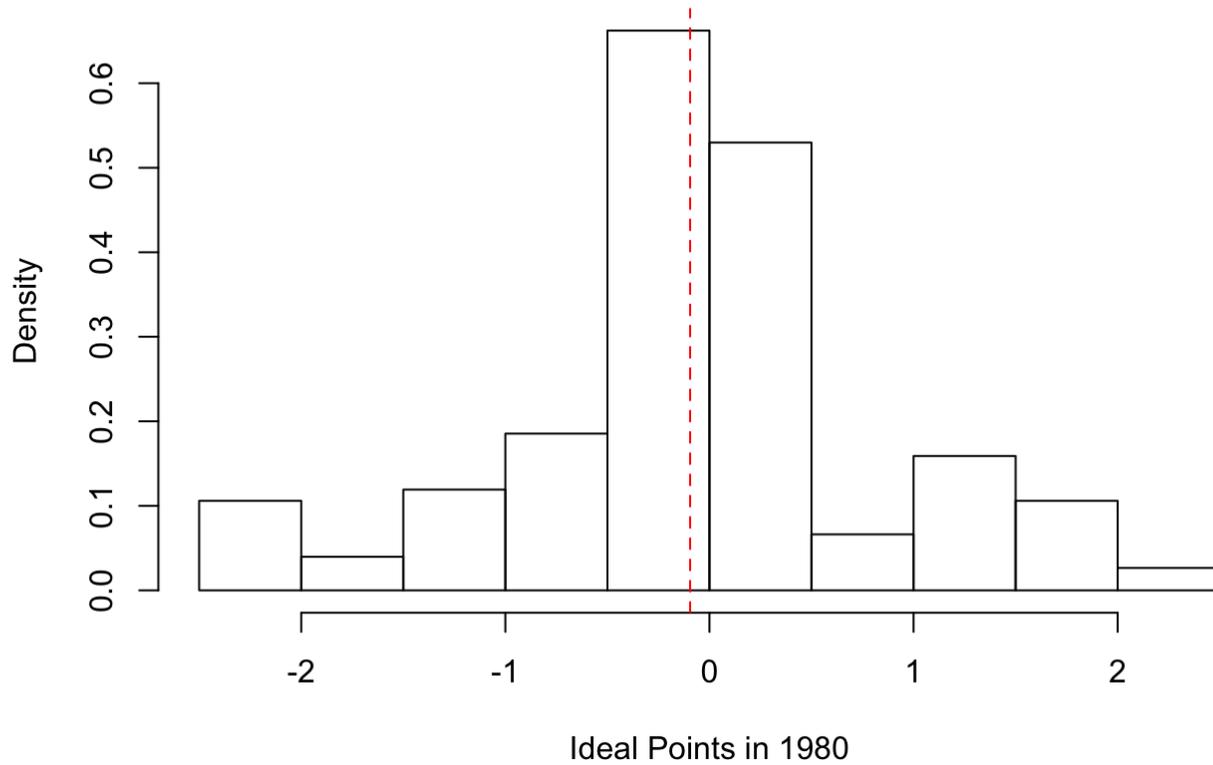
```
cor(unvoting$idealpoint, unvoting$PctAgreeUS, use = "complete.obs")
```

```
## [1] 0.7498446
```

c. Plots with median line

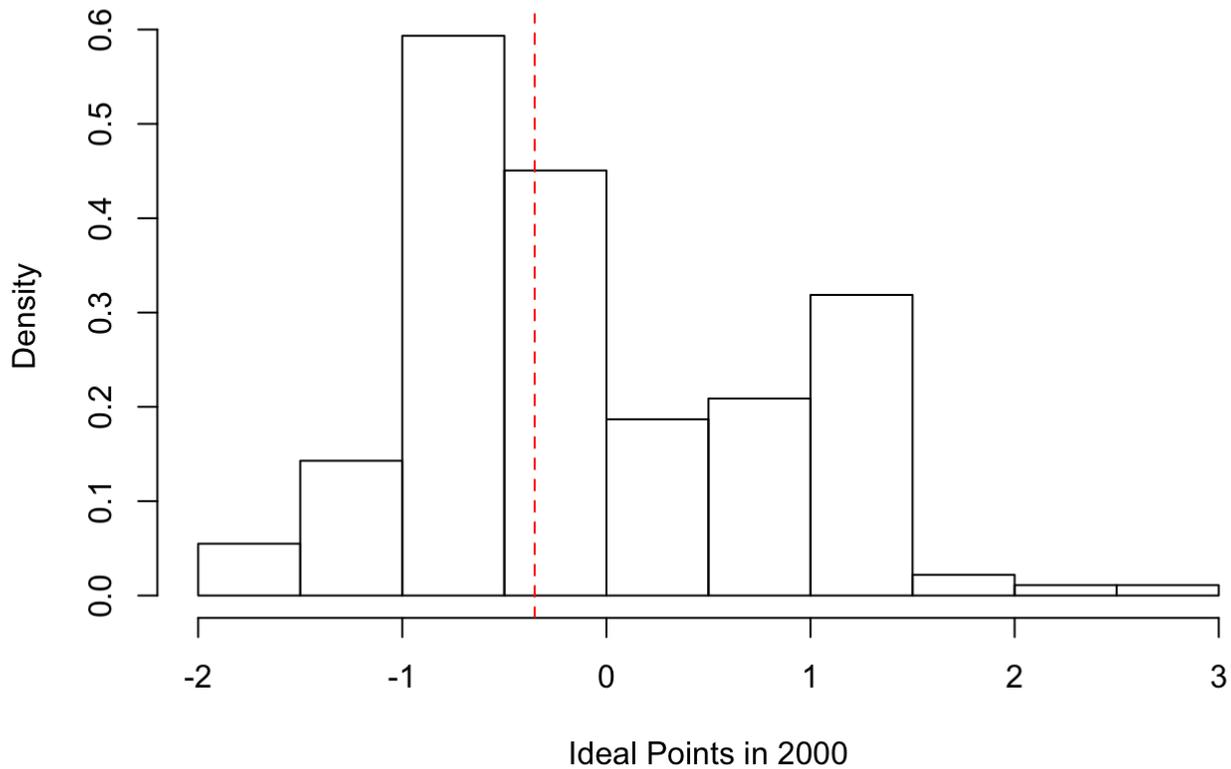
```
hist(unvoting$idealpoint[unvoting$Year == 1980], freq = FALSE,  
     main = "Distribution Before Fall of Berlin Wall",  
     xlab = "Ideal Points in 1980")  
abline(v = median(unvoting$idealpoint[unvoting$Year == 1980]),col="red", lty=2)
```

## Distribution Before Fall of Berlin Wall



```
hist(unvoting$idealpoint[unvoting$Year == 2000], freq = FALSE,  
     main = "Distribution After Fall of Berlin Wall",  
     xlab = "Ideal Points in 2000")  
abline(v = median(unvoting$idealpoint[unvoting$Year == 2000]),col="red", lty=2)
```

## Distribution After Fall of Berlin Wall



- d. In 1980, the distribution of ideal points is mainly between -1 and 1. While the density is more towards the center, there is spread including communist ideology. By 2000, the distribution of ideal points has shifted to less liberal.

```
quantile(unvoting$idealpoint[unvoting$Year == 1980], 0.25)
```

```
##          25%
## -0.345598
```

```
quantile(unvoting$idealpoint[unvoting$Year == 2000], 0.25) ## The 25th percentile has shifted as the distribution of ideal points has moved
```

```
##          25%
## -0.7021018
```

- e. The average proportion of times countries vote with the US is 0.34, the proportion of times countries vote with Russia is 0.59.

```
agree.us<- tapply(unvoting$PctAgreeUS, unvoting$Year, mean)
agree.rus<- tapply(unvoting$PctAgreeRUSSIA, unvoting$Year, mean)
mean(agree.us, na.rm = TRUE)
```

```
## [1] 0.3401592
```

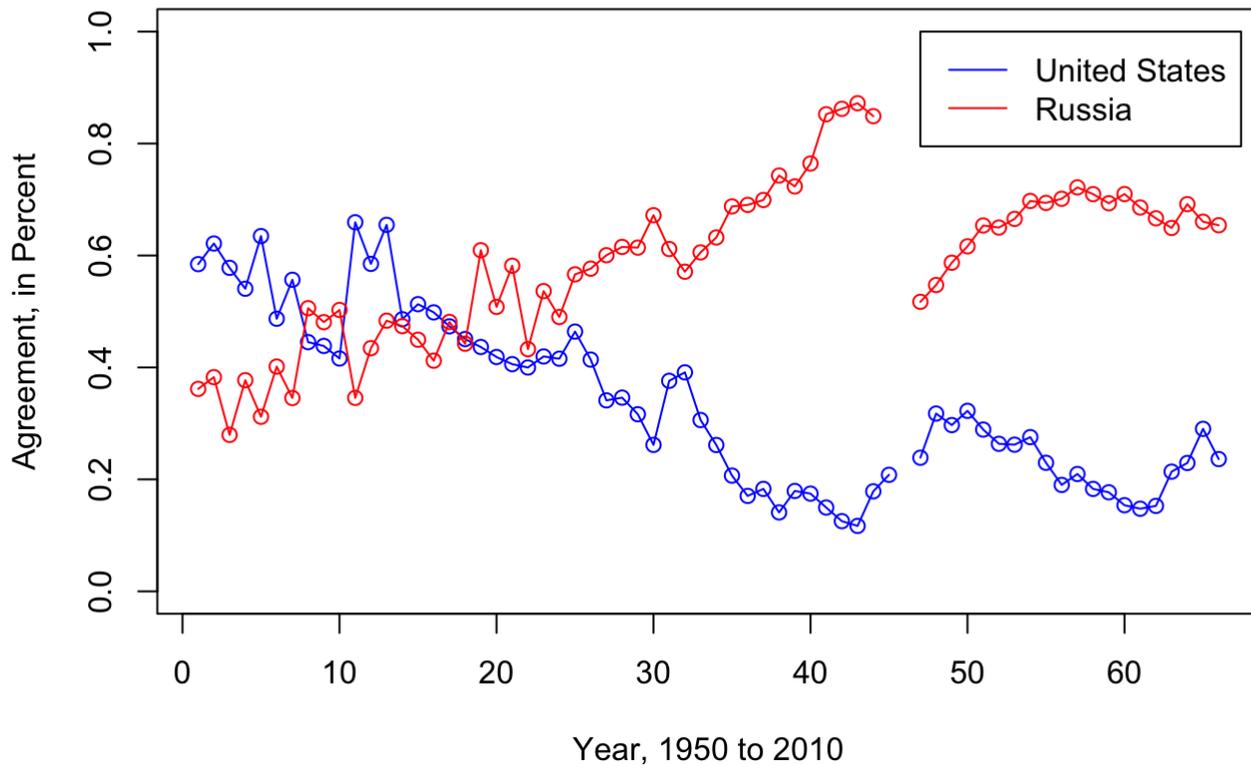
```
mean(agree.rus, na.rm = TRUE)
```

```
## [1] 0.5876808
```

f.

```
plot(agree.us, type = "o", col = "blue", ylab = "Agreement, in Percent", xlab = "Year, 1950 to 2010", ylim = c(0.0,1), main = "Average Percent Agreement with US and Russia")
lines(agree.rus, type = "o", col = "red")
legend(47,1, c("United States", "Russia"), lty = c(1,1), col = c("blue", "red"))
```

### Average Percent Agreement with US and Russia



g. The US seems to be becoming more isolated over time as the proportion of countries who vote with us in the UN decreases. This could be due to the role the US has played in the UN in recent decades, the perception of the US during the war on terror, and the willingness to abstain in UN votes.