PSC4375: Loops & Predicting

Week 5: Lecture 9

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Villanova University

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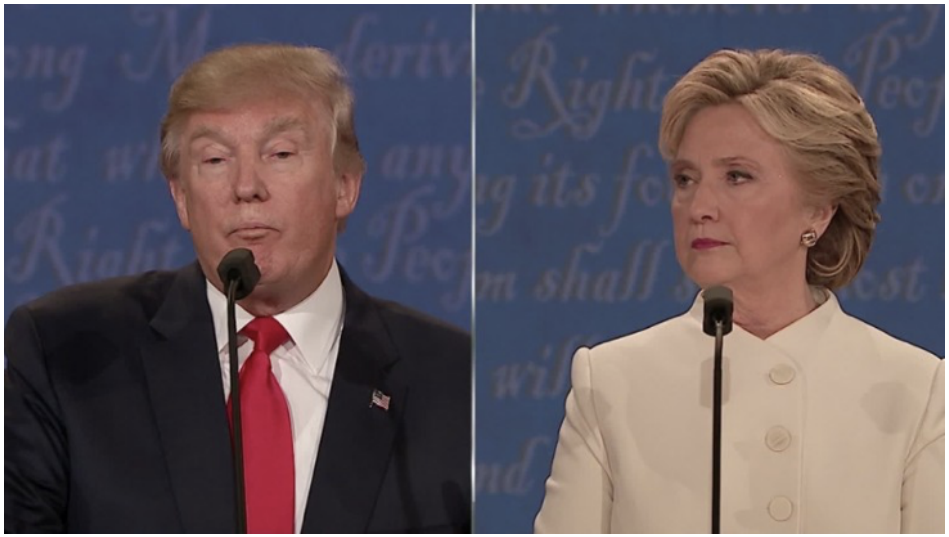
2016 US Presidential Election



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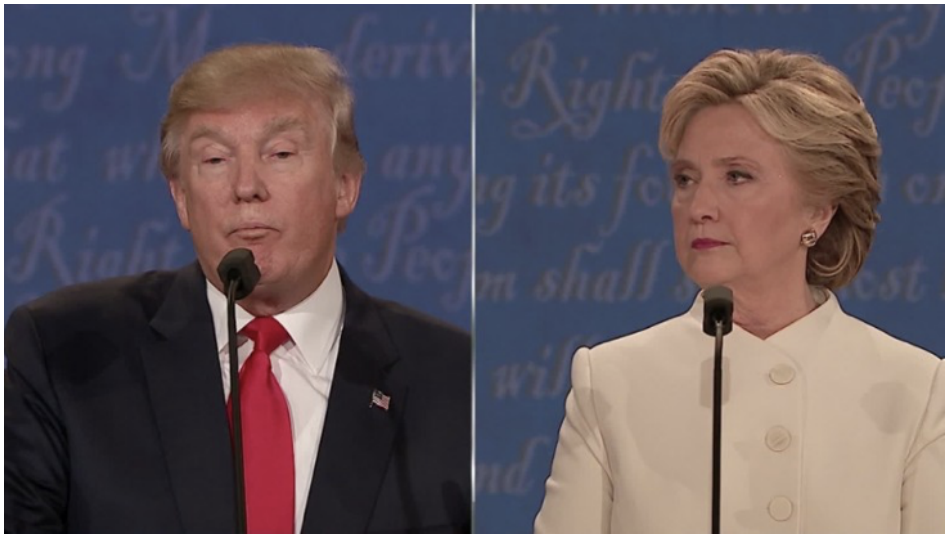

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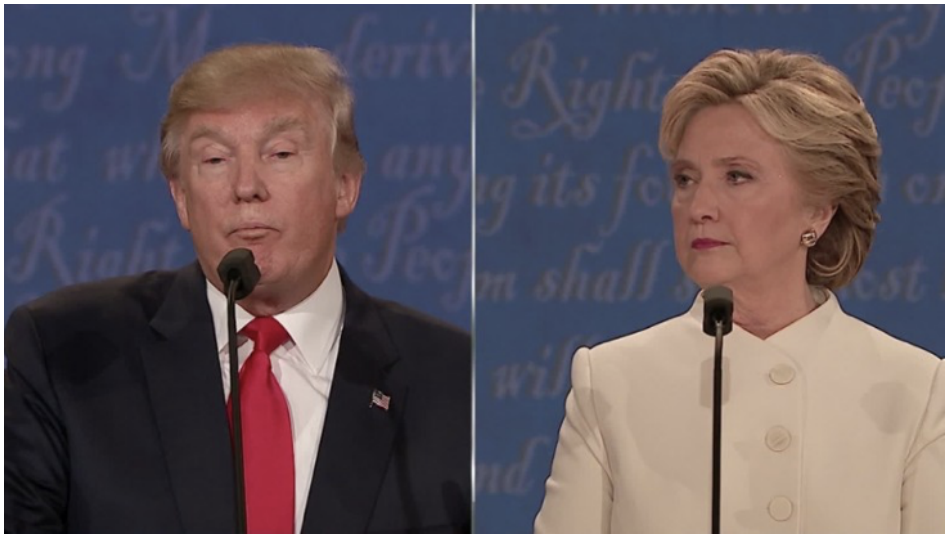

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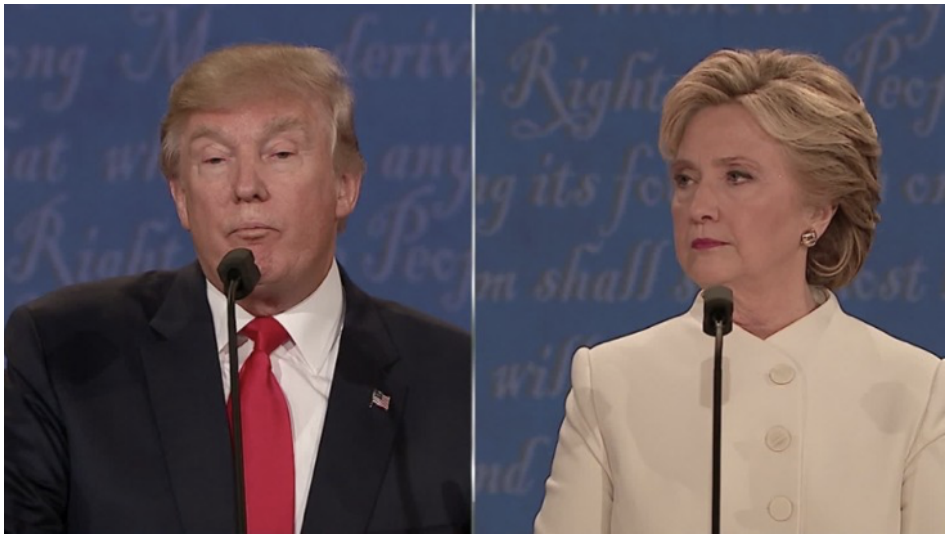

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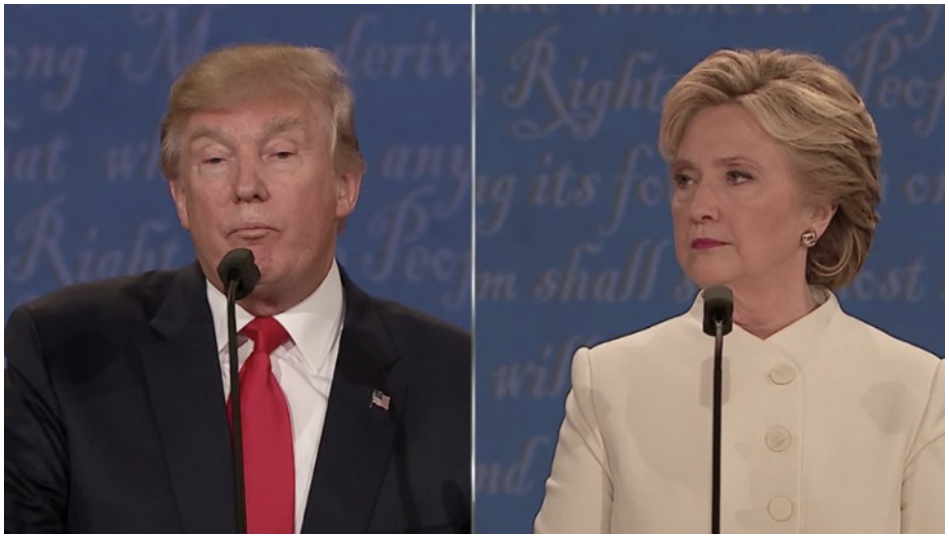

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- Election determined by 77,744 votes (margins in WI, MI, PA)
  - 0.056% of the electorate (~136million)

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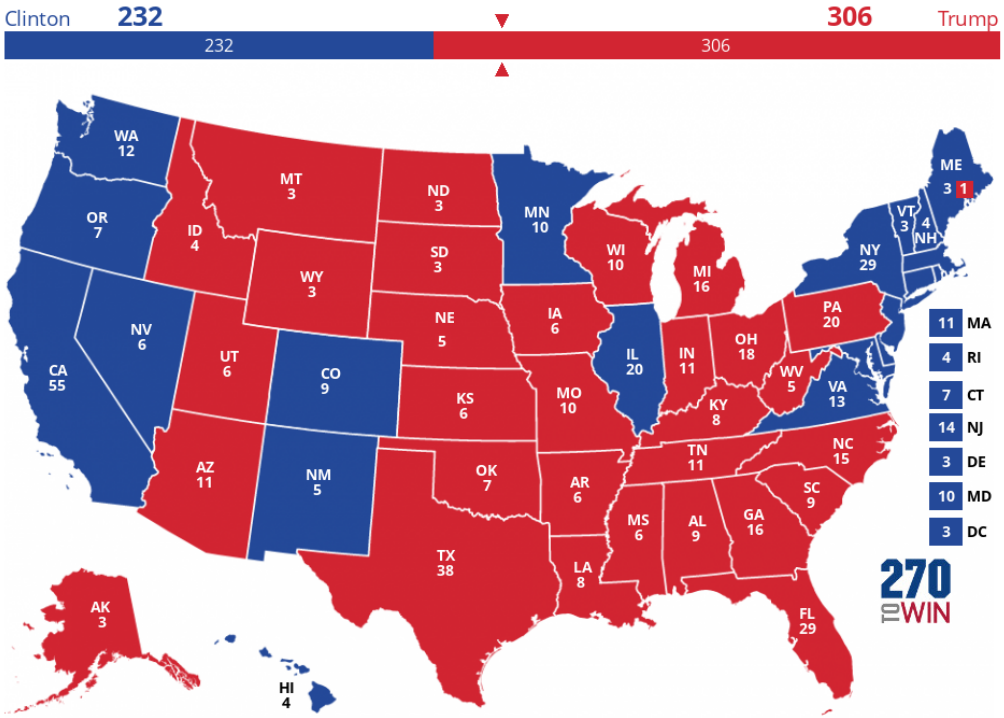

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- Sounds like a lot of subsets, ugh...

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```
values <- c(2,4,6)

## number of values
n <- length(values)

## create container to hold results
results <- rep(NA, times = n)

## multiply each value by 2
results[1] <- values[1] * 2
results[2] <- values[2] * 2
results[3] <- values[3] * 2
```

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```
## print results
results
```

```
## [1]  4  8 12
```

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  - `expression`: a set of expressions that will be repeatedly evaluated.
  - `{ }`: curly braces to define beginning and end of the loop.
- Indentation is important for readability of the code.

Loop example:

```r
values <- c(2,4,6)
n <- length(values)
results <- rep(NA, times = n)

## begin loop
for (i in 1:n) {
  results[i] <- values[i] * 2
  print(str_c(values[i], " times 2 is equal to ", results[i]))
}
```

```
## [1] "2 times 2 is equal to 4"
## [1] "4 times 2 is equal to 8"
## [1] "6 times 2 is equal to 12"
```

2016 polling prediction

- Election data: `pres.csv`

Name	Description
`state_abb`	abbreviated name of state
`clinton`	Clinton's vote share (percentage)
`trump`	Trump's vote share (percentage)

- Polling data `polls16.csv`

Name	Description
`state`	abbreviated name of state in which polls was conducted
`middate`	middate of the period when polls was conducted
`daysleft`	number of days between middate and election day
`pollster`	name of organization conducting poll
`clinton`	predicted support for Clinton (percentage)
`trump`	predicted support for Trump (percentage)

Some preprocessing

```
## download; don't forget to setwd()
pres16 <- read_csv("../data/pres2016.csv")
polls16 <- read_csv("../data/polls2016.csv")

## calculate Trump's margin of victory
polls16 <- polls16 %>%
  mutate(margin = Trump - Clinton)
pres16 <- pres16 %>%
  mutate(margin = Trump - Clinton)
```

What does the data look like?

```
head(polls16)
```

```
## # A tibble: 6 x 8
##      id state Clinton Trump days_to_election electoral_votes
##   <dbl> <chr>   <dbl> <dbl>             <dbl>           <dbl>
## 1 26255 TX         38    41                24              38
## 2 26253 WI         48    44                23              10
## 3 26252 VA         54    41                23              13
## 4 26251 NV         47    40                19               6
## 5 26250 TX         46    48                23              38
## 6 26249 NH         50    43                23               4
## # i 2 more variables: population <chr>, margin <dbl>
```

Poll prediction for each state

```r
## place holder
poll.pred <- rep(NA, 51)

## get list of unique state names to iterate over
state_names <- unique(polls16$state)

## add labels to place holder
names(poll.pred) <- state_names
```

Poll prediction for each state

```
for (i in seq_along(state_names)) {
```

Poll prediction for each state

```
for (i in seq_along(state_names)) {
  ## subset the ith state
  state.data <- polls16 %>%
    filter(state == state_names[i])
```

Poll prediction for each state

```
for (i in seq_along(state_names)) {
  ## subset the ith state
  state.data <- polls16 %>%
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  ## pull out the closest date (minimum days to election)
  min_days <- min(state.data$days_to_election)
```

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for (i in seq_along(state_names)) {
  ## subset the ith state
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  ## subset only the latest polls within the state
  state.data <- state.data %>%
    filter(days_to_election == min_days)
```

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for (i in seq_along(state_names)) {
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  ## subset only the latest polls within the state
  state.data <- state.data %>%
    filter(days_to_election == min_days)

  ## compute the mean of the latest polls and store it
  poll.pred[i] <- mean(state.data$margin)
}
head(poll.pred)
```

```
##  TX  WI  VA  NV  NH  PA
##   2  -8 -15  -7  -7  -6
```

Poll prediction for each state (my way)

```
poll.list <- list()
state_names <- unique(polls16$state)

for (i in seq_along(state_names)) {
  state.data <- polls16 %>%
    filter(state == state_names[i]) %>%
    filter(days_to_election == min(days_to_election)) %>%
    mutate(margin_poll = mean(margin)) %>%
    select(state, margin_poll)
  poll.list[[i]] <- state.data
  print(i)
}
PollPred <- do.call(rbind,poll.list)
head(PollPred)
```

Comparing polls to outcomes