SMI 606 (Intro. to Quant. Data Analysis)
Dr. Hartman

Assessment 1 (~500 words)

To help you complete this assessment, you may use resources (e.g., books, lecture notes, online guides, etc.) and/or work with other students in the class, but each person must hand in their own work (i.e., you are not allowed to copy text from someone else—that is plagiarism!).

R Markdown

You should upload your R Markdown file directly to MOLE, which will provide me with your R script, results, and any notes that you include to answer each question.

To create an R Markdown file, you should install the `rmarkdown` package via 'pacman':
```
> pacman::p_load(rmarkdown)
```

And then render your R script from the command line (NOT from the R script you wish to run!):
```
> rmarkdown::render("your R script file location and name here.R")
```

You should start your R script with the following header:
```
#' ---
#' title: "SMI 106 Assessment 1"
#' author: "Anonymous"
#' date: "`r format(Sys.Date())`"
#' ---
```

Remember, that at its most basic form, R Markdown is just an R script in which all comments # are replaced by #' as in the following:

```
#' This is an example of a comment using the R Markdown formatting.
```

Success of Leader Assassination as a Natural Experiment

One longstanding debate in the study of international relations concerns the question of whether individual political leaders can make a difference. Some emphasize that leaders with different ideologies and personalities can significantly affect the course of a nation. Others argue that political leaders are severely constrained by historical and institutional forces. Did individuals like Hitler, Mao, Roosevelt, and Churchill make a big difference? The difficulty of empirically testing these arguments stems from the fact that the change of leadership is not random and there are many confounding factors to be adjusted for.

In this assessment, we consider a natural experiment in which the success or failure of assassination attempts is assumed to be essentially random. Each observation of the CSV data set **leaders.csv** contains information about an assassination attempt (this dataset is available from the 'QSS.zip' file under the 'R Resources' section in MOLE).

Table 2.8 presents the names and descriptions of variables in this leader assassination dataset. The `polity` variable represents the so-called "polity score" from the Polity Project. The Polity Project systematically documents and quantifies the regime types of all countries in the world from 1800. The polity score is a 21-point scale ranging from −10 (hereditary monarchy) to 10 (consolidated democracy). The `result` variable is a 10-category factor variable describing the result of each assassination attempt.

Names and Descriptions of Variables in the Leader Assassination Data

Name	Description
country	country
year	year
leadername	the name of leader who was targeted
age	the age of targeted leader
politybefore	average polity score of country over 3 years prior to the attempt
polityafter	average polity score of country over 3 years after the attempt
civilwarbefore	1 if country is in civil war during 3 years prior to the attempt, 0 otherwise
civilwarafter	1 if country is in civil war during 3 years after the attempt, 0 otherwise
interwarbefore	1 if country is in international war during 3 years prior to the attempt, 0 otherwise
interwarafter	1 if country is in international war during 3 years after the attempt, 0 otherwise
result	the result of assassination attempt

1. Create a new binary variable named `success` from the `result` variable that is equal to 1 if a leader dies from an attack and to 0 if the leader survives. Store this new variable as part of the original data frame. How many assassination attempts were successful? What is the overall success rate of leader assassination (e.g., the mean of your new variable)? Discuss whether this rate is surprising to you.

2. To help with interpretation, let's rescale the variables containing polity scores (`politybefore` and `polityafter`) from 0 to 1, where 0 = monarchy and 1 = democracy. You should call the new variables `polity.pre01` and `polity.post01`, respectively. (Hint: One way to rescale a variable from 0 to 1 is to do the following:

$$recoded\ values\ of\ x = \frac{x_i - x_{minimum}}{x_{maximum} - x_{minimum}}$$

Check the descriptive statistics to make sure you have done this correctly. If you feel up to it, write a generic function to do this rescaling in R (this is optional).

3. There are at least three ways to assess causality—in this case, the effect of assassination on democracy—from observational data. First, is the simple cross-**sectional comparison**. Let's compare the average polity score after an assassination (`polity.post01`) for countries with successful attacks to those with failed assassination attempts (`success`). To estimate this effect, calculate the difference in means for `polity.post01` when `success` is 1 and `success` is 0. Is there a difference? Interpret the results.

4. Next, let's conduct a **before-and-after analysis** of polity scores in countries with successful assassinations (when `success` is 1). To do this analysis, you'll need to take the difference in means for `polity.post01` and `polity.pre01`, but only for countries with successful attacks. Is there a difference? Interpret the results and compare them to the cross-sectional comparison (above).

5. Now, let's calculate a **difference-in-difference estimate** to assess the causal effect of assassination on democracy. In other words, is there evidence that successful leader assassination causes democratization? Recall, that to conduct this analysis, you'll need to calculate the difference in means before and after a failed attempt and subtract this difference from a similar difference for successful attacks. Provide an interpretation of the results. How does your estimate for democratization compare with the first two approaches?

6. Finally, does successful leader assassination lead countries to war (or peace)? To do this, you'll first need to create two new variables called `warbefore` and `warafter` to indicate whether a country experienced civil or international war before or after an assassination attempt, respectively. Then you can calculate a difference-in-difference estimate to assess the effect of assassination on war. Interpret your results.