A frequent critique of the US criminal justice system is that incarceration turns one-time convicts into professional criminals.

- After a young person receives a criminal conviction, he or she fails background checks for years. This makes employment in the normal economy harder to achieve, which makes crime more tempting.
- In addition, the convict may meet other criminals while in jail. These new relationships may further nudge the criminal into future criminal activity (for example, by teaching criminal skills or by recruiting the convict into future black market opportunities).

Harsh sentencing could thus be creating more criminals, which would clearly reduce the benefits of convictions and criminal sentences. President Obama referred to this as the "cycle of crime." On the other hand: Obama's theory may simply be a speculative theory. In this assignment, you will work on a measurement strategy for assessing the "cycle of crime."

Questions:
1. What implicit claim about causality does Obama's "cycle of crime" theory assert?

The incarceration of an individual causes the convict to commit future crimes.

2. Your friend has an ingenious idea. He/she has detailed case data about criminal sentencing in a large jurisdiction for everyone charged with a felony. The data includes the length of the prison sentence (in days), and whether the person was convicted of a second crime after he/she was out ("recidivism"). This seems to be what the "cycle of crime" theory is talking about.

   The proposed research design is: Run a regression whose outcome is recidivism and whose main explanatory variable is the length of the prison sentence. React your friend's research design.

Firstly, my friend's research design tackles a different claim that harsher sentences, rather than just convictions, lead to future criminal activity. I think this still captures an essence of the cycle of crime that is worth looking at. However, the regression would only give correlations because people are not randomly assigned different lengthed sentences. It would be reasonable to think that people who commit felonies that warrant longer sentences are also more likely to commit a second crime.

   3. *Dataset*

```
Variable        Storage   Display    Value
   name          type     format     label       Variable label
-------------------------------------------------------------------------
defendantid     int      %8.0g                    Defendant.Id
republicanjudge byte     %8.0g                    Republican.Judge
severityofcrime byte     %8.0g                    Severity.Of.Crime
monthsinjail    float    %9.0g                    Months.In.Jail
recidivates     byte     %8.0g                    Recidivates
```

4. Perform a balance test. Does the judge's party really seem to be randomly assigned?

```
                              Control    Treatment   Difference
          ----------------------------------------------------------
          Severity.Of.Crime            1.979       1.966       0.014
```

The balance test indicates a random assignment of judges to cases with regards to severity of crime.

5. Describe in words the ``first stage'' of the IV design. Show table.

The first stage of the IV design is to determine if the IV (republican judge) is a strong predictor of the endogenous variable (months in jail), controlling for the treatment (severity of crime).

	(1) Months.In.Jail
Republican Judge	3.222∗ ∗ ∗ (0.367)
Severity of Crime	18.15∗ ∗ ∗ (0.226)
R-squared	0.565
Observations	5000

Standard errors in parentheses
∗ $p < 0.1$, ∗∗ $p < 0.05$, ∗∗∗ $p < 0.01$

6. Interpret the coefficient on your instrument from the first stage.

On average, being assigned to a Republican judge increases the jail time by approximately 3.222 months compared to being assigned to a non-Republican judge, controlling for the severity of the crime.

7. Calculate the "reduced form." Your reduced form regression will be

```
    recidivates | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
----------------+----------------------------------------------------------------
 republicanjudge |   .1426641   .0124434    11.47   0.000     .1182697    .1670586
 severityofcrime |   .1885599   .0076618    24.61   0.000     .1735395    .2035803
           _cons |  -.1139591   .0175983    -6.48   0.000    -.1484595   -.0794587
```

8. Calculate the ratio of the reduced form

Ratio = .04427983

9. Now complete the IV regression and make a publication quality table of the second stage. Use the setup below.

	(1) Recidivates
Months in Jail	0.0443∗ ∗ ∗
	(0.00576)
Severity of Crime	−0.615∗ ∗ ∗
	(0.105)
R-squared	−0.944
Observations	5000

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

10. State the F-stat in your writeup. It does not need to go into your table (although, in an actual publication it would). Is it above the conventional threshold?

The first-stage Cragg-Donald Wald F-statistic is 76.868, which is well above the conventional threshold of 10. This confirms that the IV (republican judge) is strong.

11. Compare your answer to question #8 (above) to the IV coefficient in #9.

They are the same (at least with rounding).

12. Complete these sentences.
   ○ In the research design above (using randomized judges), the **always-takers** are the defendants who are always given longer sentences no matter the judge's political party.

   ○ The **never-takers** are the defendants who are always given shorter sentences no matter the judge's political party.

   ○ The **compliers** are the defendants who are given longer sentences only if they are assigned to a republican judge.

   ○ The **defiers** are the defendants who are given shorter sentences only if they are assigned to a republican judge.

13. Comment on the monotonicity assumption and the possibility of "defiers" in this setting.

This assumption may be presumptuous in this research design, because there could be certain cases republican judges are more lenient toward. For example, it could be possible that republican judges are more lenient with firearm offenses. There should be more evidence to base this assumption on.

14. In your dataset, what types of defendants are compliers?

I would think that compilers are defendants who committed a moderate severity of crime, but when I ran a regression to test the interaction term of republican judges and severity of crime on months in jail, there was no significant result. So I don't know.

15. Does the cycle of crime hypothesis appear to be true for the compliers?

Yes, based on the analysis, the cycle of crime hypothesis appears to be true for the compliers.