EXAM 2 PRACTICE PROBLEMS

As before, the expectation is that you will spend five minutes on each question, and the whole test will have 7-8 questions.

From notebooks.

   (1) In the weapons flow notebook, what is this dictionary for?

```
{
    "Biafra": ("Enugu", 7.5139, 6.4483),  # 1967 capital (now part of Nigeria)
    "Bosnia-Herzegovina": ("Sarajevo", 18.4131, 43.8563),
    "South Yemen": ("Aden", 45.0176, 12.7906),
    "Katanga": ("Lubumbashi", 27.5026, -11.6876),
    "South Sudan": ("Juba",  31.5825, 4.8539),
    "Palestine": ("East Jerusalem", 35.217018, 31.771959),
    "Aruba": ("Oranjestad", -70.0353, 12.5227),
}
```

NOTE TO HELP YOU STUDY: this is not a memorization question. This is something you can absolutely work out from what's here if you have a basic idea of how the notebook works.

A simple and correct answer would be that for these seven countries, we are assigning them a capital and giving its latitude and longitude so that we can plot them on a map. (That's a 3/4 answer.) A fuller answer would be that data cleaning often requires us to handle messy or exceptional cases separately, and these are seven places that have not always been included in lists of countries—for example, South Sudan only became a country in 2011, and Biafra no longer exists as a country. So these were not automatically covered by the process we developed for most of the world, and that's why we had to name a capital and manually enter its latitude and longitude.

   (2) Braintree Precinct 5B has CVAP 1961.845304 in the `ma_ward_precinct_gdf` that we built in the elections notebook. But CVAP stands for citizen voting age population — how come it is not a whole number?

NOTE TO HELP YOU STUDY: as you review the notebooks, be sure you're reading all the text we provided, which flags important ideas for you.

If you only say "CVAP is an estimate" or "CVAP is based on a survey," that's a 2/4 answer—that's not the reason for these precise-looking decimals. It's certainly true that it's an estimate, but it's published as whole numbers on larger geographies called tracts.
The reason it's not a whole number is what we had to do to move it from tracts to precincts. A large part of this notebook was about this! This is done by a process called **proration** (just like prorating rent for part of a month). Proration breaks down CVAP from tracts to the smallest unit, census blocks. You can do this proportional to each block's share of area, but our notebook did this proportional to each block's share of population. That's what made fractions appear. Then we added it back up to the precinct level so that CVAP and votes are on the same units.

(3) Annotate/explain this code.

```python
net_migration_graph = nx.DiGraph()

for a_county, a_county_fips in nyc_county_fips_codes.items():
    for b_county, b_county_fips in nyc_county_fips_codes.items():
        if a_county == b_county:
            continue

        flow = flow_df.loc[(a_county_fips, b_county_fips)]
        net_flow = flow["net_flow_est"]
        if net_flow >= 0:
            net_migration_graph.add_edge(
                a_county,
                b_county,
                weight=net_flow,
            )
        else:
            net_migration_graph.add_edge(
                b_county,
                a_county,
                weight=-net_flow,
            )
```

Here are a bunch of valid annotations, just as examples of things you could say here.

`nx` is NetworkX – that's Python's basic package for handling graphs.
`DiGraph` is a directed graph, meaning that the edges have arrows.
`DiGraph()` creates an empty graph, with nodes and edges to be added later.
FIPS codes are numerical codes used to identify geographies.
The reason for splitting the logic into the first chunk (`if net_flow >= 0`) and the rest (`else`) is that a positive flow from a to b will be an arrow from a to b, while a negative flow will be an arrow from b to a.
The reason for separating out the case where `a_county == b_county` is to exclude flows from a county to itself. (No self-loops.)
Nodes get automatically added when they are endpoints of edges, so we didn't need to add them separately.

From readings and lectures.

NOTE TO HELP YOU STUDY: You'll be graded on two things: are you showing knowledge from this course? And are you writing at the college level? It's not a checklist where you have to mention things that were on the slides.

WEAPONS
What is TIV and why is it useful for the study of the arms trade?

TIV stands for "trend-indicator value" (but I don't care if you remember what it stands for exactly). It is a quantitative value used for comparison. In class we called this a "commensurating unit"—it makes things comparable, like money does when you want to compare a dirt bike to a pig. It controls for the fact that the dataset has a lot of variation over time and type of heavy weapon. It is not just money value, but also takes lethality into account, and SIPRI thinks of it as a measure of military capability.

ELECTIONS

In Rodden's interview, he says "And so what my argument is about is that these places that are voting, you know, 85, 90% for the Democrats tend to be places like downtown Cleveland, where there's no manufacturing to speak of any more." What are some of the theories discussed by Rodden and Roberts (the interviewer) about why former industrial areas are currently left-leaning?

Rodden argues that 19th century factory towns had dense housing built and infrastructure like rail to get around. Even after factory workers were gone, the housing and transit endured, and this drew people who are willing to live densely, whether because they need to live close to work or because they want to live next to their latte shop. So it either drew or formed people aligned with the Left. Generally, around the world, the Left parties are those associated with Labor who are aligned with the interests of workers. (Though, to go past the reading into other topics discussed in lecture, this Labor-Left nexus may be weakening in the 21st century—in which case it would be a slow but important realignment akin to the Solid South realigning with Republicans that was triggered Democrats became the party of civil rights in the 1960s.)

MIGRATION

Moretti writes that "In 2009, at the peak of the Great Recession, unemployment in Detroit reached 20 percent, while unemployment in Iowa City, about 500 miles west of Detroit, was only 4 percent." What factors does he diagnose that might predict whether someone moves from Detroit to Iowa City to seek a job? What related policy intervention does he propose?

The major predictive factor he discusses is education, particularly college education. He gives some numbers to show that attending college makes Americans far more likely to move over their lives. Other factors he discusses include cultural expectations (many Italians expect to live close to their parents for their whole lives), lack of cash (moves are expensive) and needing to be close to family for help with child care.

He sees this as a policy problem both in terms of efficiency and productivity—when unemployment is higher, it's bad for individuals and also the economy makes less stuff. His proposed solution is "relocation vouchers" or "mobility vouchers." These could be in the form of individual payments that would make it easier to move. This benefits those who move, and also benefits those who don't, by reducing competition for scarce jobs.

ORGANS

What are some elements that Kieran Healy identifies as downsides or limitations of using market/financial incentives to improve the availability of kidneys and blood for medical use?

One downside is moral qualms about commodifying the body, which should be treated with intimate or spiritual value. Another is a practical worry that this can lead to exploitation of vulnerable people. (The analogy of **vampires** is invoked a few times—a blood plasma center protested as *casa de vampiros* or Marx citing "the vampire thirst for the living blood of labor"—to emphasize a lack of real consent.) A third downside is that when you monetize things, people can paradoxically become less likely to give them away, because it nullifies the sense of community spirit or civic duty invoked by the framing of gifts or donations.

TRANSIT

How is mandating minimum parking requirements like treating sick people with lead?

A simple (3/4) answer is that both are examples of a "Do-Something" mentality that pressures doctors and policymakers to do something visible when they don't know how to really solve a complicated problem. A deeper answer (4/4) might point out that complicated problems incentivize you to convert little evidence into absurdly specific instructions ("precise, disciplined folly"). Going beyond lead treatment, Shoup cites examples where polio (a serious virus of the nervous system) was treated with strychnine (rat poison!), mercury, ice baths, and bleeding, in a strict order and with exact amounts. These things have an immediate effect (of course!) but in the big picture, they make the problem worse.