

## Programming for Social Scientists

Johan A. Dornschneider-Elkink

## Final session

# Reflective essay

- Between 2,000 and 2,500 words
- Due: 5 May, 5 pm
- Think about challenges you experienced with programming, team work, simulations.
- What challenges did you encounter and how did you try to improve. What might you improve in future?
- Evaluate yourself, not others! Do not name others.
- Focus on one or two salient points.
- See syllabus for detailed description.

import sqlite3

```
conn = sqlite3.connect("elections.db")
cur = conn.cursor()
```

Using S2L in Python

```
cur.execute("CREATE TABLE IF NOT EXISTS results (state TEXT, candidate TEXT, votes INTEGER)")
cur.executemany("INSERT INTO results VALUES (?, ?, ?)", [
```

```
("PA", "Smith", 3200000),
    ("PA", "Jones", 3100000),
    ("OH", "Smith", 2800000),
    ("OH", "Jones", 2850000),
    ("GA", "Smith", 2500000),
    ("GA", "Jones", 2550000),
conn.commit()
```

cur.execute("SELECT state, candidate, votes FROM results WHERE votes > 3000000") for row in cur.fetchall(): print(row)

```
cur.close()
conn.close()
```

])



### What we covered

#### Thinking like a programmer

- Break down the challenge
- Do not duplicate code
- Hide implementation

#### **Object-oriented programming**

- Objects, classes, methods
- Inheritance
- Class diagrams

#### **Basics of software design**

- Logging, input and output
- Exceptions and error handling

# What we didn't do: Data Science

- NumPy
- Pandas
- Matplotlib / Seaborn
- Scikit-learn
- Statsmodels
- TensorFlow / PyTorch
- Jupyter Notebooks



What we didn't do: Python List comprehensions

Tuples, unpacking

Generators, yield

Lambda functions

Decorators

Type hints

List comprehencion

voter\_ids = [v.id for v in voters if v.registered and v.state == "PA"]

@log\_query

def get\_congress\_members(state): ...

Unpacking a tuple state, votes = ("Georgia", 1650000)

Vield
def poll\_results(districts):
 for d in districts: yield get\_votes(d)

Type hinting

def turnout\_rate(votes: int, population: int) -> float:

Lambda function

swing\_states.sort(key=lambda x: x.vote\_margin)

# How is the project going?