Review of Lab 9

- If the U.S. Census Bureau wanted you to figure out the most popular names in the U.S. or the most popular baby names last year, what would you need to do to change your program?

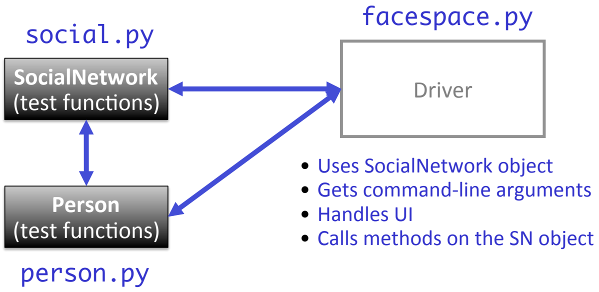
Review Lab 9

- How can you get all the values from a dictionary?
  - How can you turn it into a list?

More work with dictionaries in lab10.
Make sure you understand how to use dictionaries.

Lab 10 Design

- 3 files: `person.py, social.py, facespace.py`

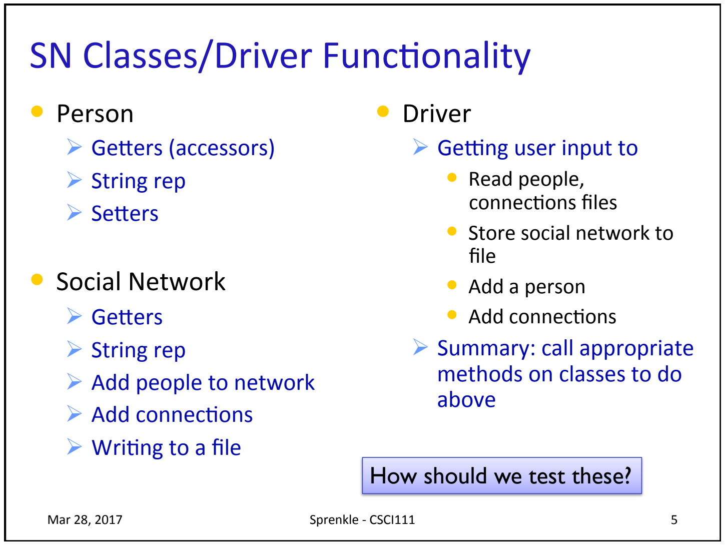


- Uses SocialNetwork object
- Gets command-line arguments
- Handles UI
- Calls methods on the SN object

Social Network Classes/Driver Data

- Person
  - Id
  - Name
  - Friends
- Social Network
  - People in network
- Driver (UI)
  - Social network

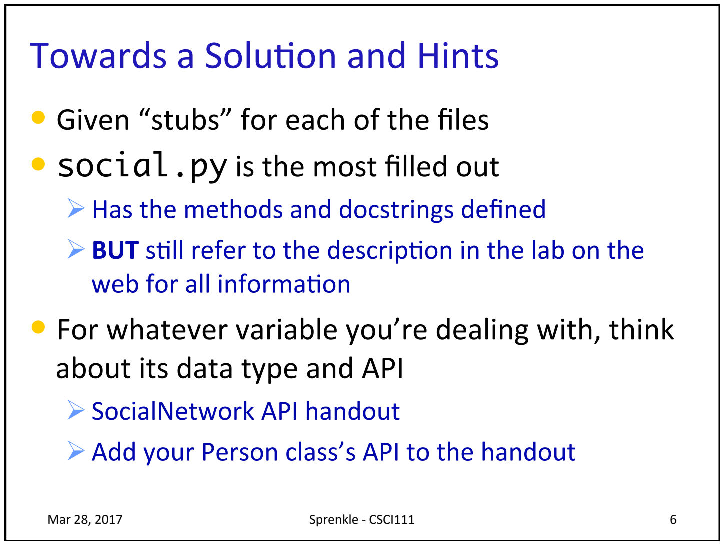
What are the data types for each class's data?



SN Classes/Driver Functionality

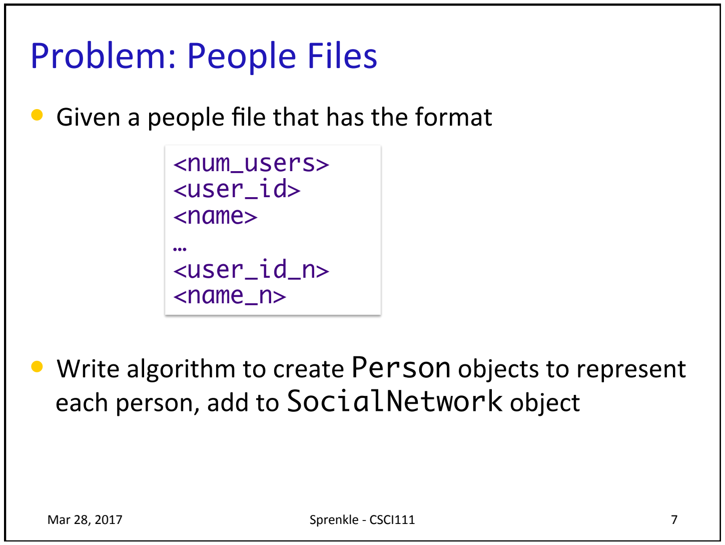
- Person
  - Getters (accessors)
  - String rep
  - Setters
- Social Network
  - Getters
  - String rep
  - Add people to network
  - Add connections
  - Writing to a file
- Driver
  - Getting user input to
    - Read people, connections files
    - Store social network to file
    - Add a person
    - Add connections
  - Summary: call appropriate methods on classes to do above

How should we test these?



Towards a Solution and Hints

- Given “stubs” for each of the files
- `social.py` is the most filled out
  - Has the methods and docstrings defined
  - **BUT** still refer to the description in the lab on the web for all information
- For whatever variable you’re dealing with, think about its data type and API
  - SocialNetwork API handout
  - Add your Person class’s API to the handout

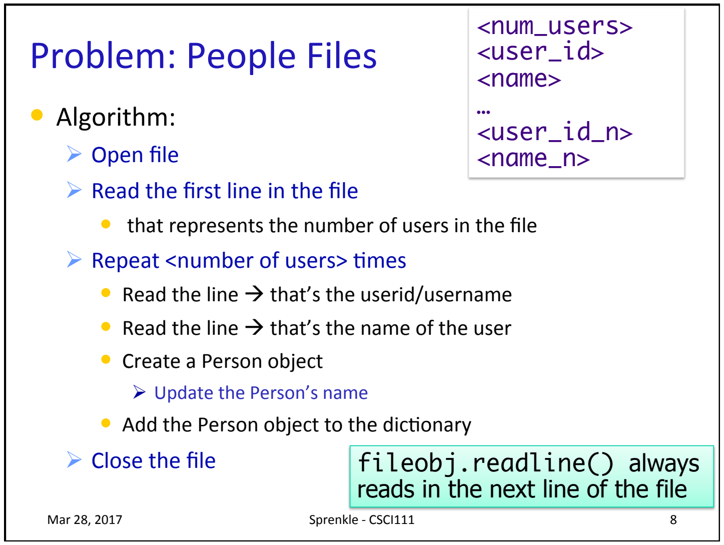


Problem: People Files

- Given a people file that has the format

```
<num_users>
<user_id>
<name>
…
<user_id_n>
<name_n>
```

- Write algorithm to create `Person` objects to represent each person, add to `SocialNetwork` object



Problem: People Files

```
<num_users>
<user_id>
<name>
…
<user_id_n>
<name_n>
```

- Algorithm:
  - Open file
  - Read the first line in the file
    - that represents the number of users in the file
  - Repeat <number of users> times
    - Read the line → that’s the userid/username
    - Read the line → that’s the name of the user
    - Create a Person object
      - Update the Person’s name
    - Add the Person object to the dictionary
  - Close the file

`fileobj.readline()` always reads in the next line of the file

Problem: Connection Files

- Given a connection file that has the format

```
<user_id> <user_id>
<user_id> <user_id>
…
<user_id> <user_id>
```

- Each line represents a friend/connection
  - Symmetric relationship
  - Each is a friend of the other
- Update `SocialNetwork` object

UI Specification

- Checks if user entered command-line argument
  - Default files otherwise

(see later slides)

- Read people, connections from files
- Repeatedly gets selected options from the user, until user quits
- Repeatedly prompts for new selection if invalid option
- Executes the appropriate code for the selection
- Stops when user quits
- Stores the social network into the file

Write pseudocode

UI Pseudocode

```
Use default files if only one command-line argument
Read people, connections from files
while True:
    display menu options
    prompt for selection
    while invalid option
        print error message
        prompt for selection
    break if selected quit
    otherwise, do selected option
Store social network to designated file
```

Why not a GUI?

Implementation Plan

1. Implement `Person` class
   - Test (write test function, e.g., `testPerson()`)
2. Implement `SocialNetwork` class
   - Example runs in lab write up
   - Note: Methods for classes will **not** prompt for input; Use **input parameters**
   - Test
3. Implement driver program

Plan for Implementing a Class

- Write the constructor and string representation/ print methods first
- Write function to test them
  - See card.py for example test functions
- While more methods to implement …
  - Write method
  - Test
  - REMINDER: methods should not be using input function but getting the input as parameters to the method

Export SocialNetwork to Files

- I provide method to write connections to a file
  - Because only want connection once
- You handle writing to people file
  - Must be in **same format** that you read in
  - Just "undoing" the read
- Good test: if you read in a people file, export it to another file → original and exported file should look similar
  - If you read in that exported file, should see same social network
  - Files themselves may not be exactly the same because of order printed out

Test Data

- SocialNetwork requires: People file, Connections file
- Social Networks:
  - Simple
  - Hollywood
  - Randomly generated files
    - From W&L first and last names, randomly combined, connected
- Can combine different files to create larger social network

COMMAND-LINE ARGUMENTS

Command-line Arguments

- We can run programs from terminal (i.e., the "command-line") and from IDLE
- From the command-line, can pass in arguments, similar to how we use Unix commands
  - Ex: `cp <source> <dest>`

    Command-line arguments
  - Ex: `python3 myprog.py 3`
- Makes input easier
  - Don't have to retype each time executed

Command-line Arguments

- Using the `sys` module
  - What else did we use from the `sys` module?

```
python3 myprogram.py 3

python3 command_line_args.py <filename>
```

List of arguments, named `sys.argv`

- How can we access "`<filename>`"?
  - Then we can use in our program

Command-line Arguments

- Using the `sys` module

```
python3 command_line_args.py <filename>
```

`sys.argv` →

command_line_args.py	<filename>
0	1

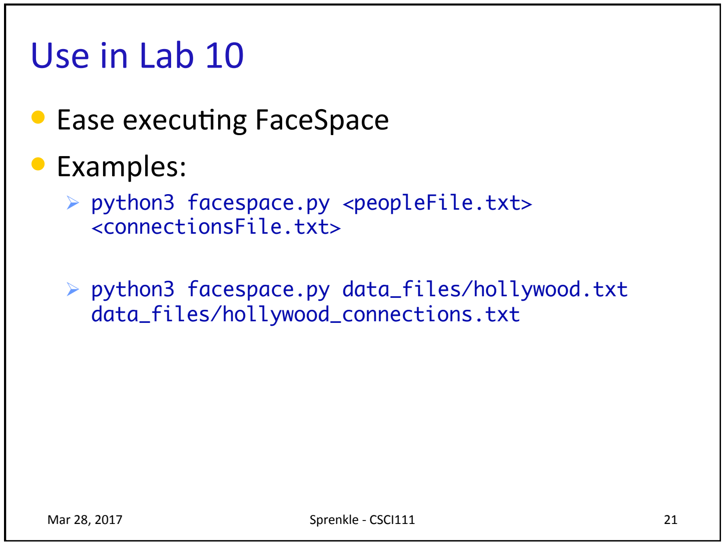
- How can we access "`<filename>`"?
  - `sys.argv` is a ***list*** of the arguments
  - `sys.argv[0]` is the name of the program
  - `sys.argv[1]` is the filename

`command_line_args.py`

Using Command-line Arguments

- In general in Python:
  - `sys.argv[0]` is the Python program's name
- Have to run program from terminal (not from IDLE)
  - Can edit program in IDLE though

➔ Useful trick:
  - If can't figure out bug in IDLE, try running from command-line
    - May get different error message



Use in Lab 10

- Ease executing FaceSpace
- Examples:

  -
    ```
    python3 facespace.py <peopleFile.txt>
    <connectionsFile.txt>
    ```

  -
    ```
    python3 facespace.py data_files/hollywood.txt
    data_files/hollywood_connections.txt
    ```