

Assignment 9

Objectives: Approach old problems using Object Oriented Programming. Write classes and methods.

Note: Include DocStrings in each script you submit analogous to the following:

```
"""Creates a directory of representatives using OOP
```

```
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The same problem handled before but using object oriented programming.
In particular, constructors, get-methods and set-methods are used.
Two classes are defined: Seat, which contains the information for the seat
and Person, which contains the information for the representative.
"""
```

Make single-line DocStrings for all methods and multiline DocStrings for all classes. For the latter use a similar format as for the DocStrings used for the scripts: in the lower part of the DocString include a simple description for each attribute and a simple description for each method: in many cases PyCharm should prompt you.

Note: In all the scripts below, you are to catch the exceptions when opening files and tell the user there was a problem opening the file.

Full assignment. House of representatives

For this assignment, we'll make classes to represent key types of information to be stored. The general script for the search will remain similar as the one we used before: see below.

Key aspects: Use `csv.DictReader`. Make a **Seat** class for the seats in the house of representatives: these seats will correspond to a district in a state or a state at large. We will assume that the phone number and the office number are fairly constant and associated with the **seat** rather than with the person holding the seat. We will also make a class **Person** that will be associated with the positions: that is, the representatives as persons.

For simplicity, collect all the labels manually and make appropriate variables to be able to extract the information from the mini-dictionary read with the dictionary reader.

```
state_label = "State or Territory"
district_label = "District or Representation Type"
phone_label = "Phone "
office_label = "Office Room "
given_name_label = "Given name"
family_name_label = "Family name"
party_label = "Party "
```

Task 1 (3 points). Read the house of representatives file and make an object seat for each state and district: include the at-large and the numbered districts but ignore the rest. The constructor for this class should set only the state and the district via the arguments. The phone number and office number attributes will be set to empty strings.

In the class, make a method that sets the phone number and another method that sets the office number. Notice that at this point, the objects do not have a person associated with them.

Make a method `__str__` that returns a string analogous to the following:

Seat for district 12 in the state of New York.

Phone number: (202) 225-7944

Office: 2308 RHOB

Keep all the seats in a dictionary: the **tuple of state and district** as the **key** and the **seat object** as the **value**. Print the dictionary. Name the file `[NetID]_house_OOP_1.py`.

Task 2 (3 points). While reading the house of representatives file, assign the information for the representatives to objects of a class `Person`. The constructor for this class should set the given name and the family name for the representative. (We could also include other personal information here but it will become unnecessarily complex.)

Initially, make three methods for this class. The first one allows us to get the given name, the second one allows us to get the family name and the third one allows us to get the full name as a single string. (In general it would be a good idea to also make methods to set the first two values. However, we won't be doing that here for simplicity.)

Make a method `__str__` that returns a string analogous to the following:

Representative: Carolyn Maloney (D)

Important: use the method you made before to get the full name and then append the party bit to it. Also handle the situation where the party has not been set. The output in such case should be:

Representative: Carolyn Maloney

Print each representative object as it is made. Name the file `[NetID]_house_OOP_2.py`.

Task 3 (3 points). Make a method in the `Seat` class that allows the association of an object of the `Person` class with the seat by providing an attribute named `rep`. Make a method that allows us to get the full name for the person in the seat class: this method will call the corresponding method in the `Person` class for the object corresponding to the appropriate representative.

Modify the `Person` class so that in the constructor a new attribute `party` is set to an empty string. Make an additional method that allows us to set the party.

Modify the `__str__` method so that it now includes the party information but only if it has been set: i.e., it is not an empty string.

Representative: Carolyn Maloney (D) # or

Representative: Carolyn Maloney # If party not set

Notice how contained the changes now are.

Print the house dictionary. Name the file `[NetID]_house_OOP_3.py`.

Task 4 (2 points). Final touch. To make this similar to previous assignments, we will make a script to retrieve information about specific representatives. We used objects before but they were not as fancy as the ones we have now. The task is done just as we did before but using our fancy classes/objects now. In this script

- read the file of representatives one row at a time
- store the information for the seats in the appropriate objects
- make the appropriate person object for each seat to store the info for the representative
- associate the person with the seat by setting the representative for the seat
- store each seat in a dictionary using a tuple with the state and the district as the key
- ask the user to input a state and district
- retrieve the information of the seat and the representative and display it by directly printing the seat object.

Modify the `__str__` method for the `Seat` class to make the information for At-large representatives be printed better.

At large seat for the state of Alaska.

Phone number: (202) 225-5765

Office: 2314 RHOB

Representative: Don Young (R)

But still for the others it should be as follows:

Seat for district 12 in the state of New York.

Phone number: (202) 225-7944

Office: 2308 RHOB

Representative: Carolyn Maloney (D)

Name the file `[NetID]_house_OOP.py`.

Only submit the most advanced file you generated: **a single file**. For example, submit only `[NetID]_house_OOP.py` if you finished the last task, otherwise `[NetID]_house_OOP_3.py` if you finished Task3 and so on and so forth.