Lab Assignment Week 04

CSC/DSCI 1301 – Principles of CS/DS I

Week of February 3rd, 2025

Introduction

Welcome to the fourth programming lab of CSC/DSCI 1301! Today we will be covering the following topics:

- Using the modulo and floor division operators
- Lists and Sequence Functions
- Sets and Set Operations
- Creating and Accessing Dictionary

Lab policy reminders:

- Attendance is mandatory.
- Labs must be completed **individually.**
- TAs are here to help you. Ask them for help!

Comments

The lab assignment requires the inclusion of comments to enhance code readability and understanding. Specifically, a block comment at the beginning of the Python file is required. Your block comment should include the following:

- The program name
- The author's name (your name)
- A description of the program's overall purpose

Additionally, inline comments should be used throughout the code to explain specific lines or sections that might be less obvious to someone reading the code. These inline comments can clarify complex calculations, explain the purpose of certain variables, or provide additional context for specific code blocks.

Deliverables:

1. Python files for all 3 programs in the lab
2. Screenshots of program output for all 3 programs

If you have any questions, please do not hesitate to ask your TA!

Program 1: phone.py

For the first program in today's lab, you will need to write a program that formats a given phone number as input. Given an integer representing a 10-digit phone number, output the area code, prefix, and line number using the format (800) 555-1212.

If the input is:

8005551212

The output in the terminal should be:

(800) 555-1212

For simplicity, assume any part starts with a non-zero digit. So, (011) 099-0888 is not allowed.

Example Terminal Output:

```
Please enter your phone number: 5551845933
Phone Number: (555) 184-5933
```

Hints

1. Use % to get the desired rightmost digits.
    a. Ex: The rightmost 2 digits of 572 is obtained by 572 % 100, 72.
2. Use // to remove the rightmost digits.
    a. Ex: Shifting 572 right by 2 digits is done by 572 // 100, which yields 5. (Recall integer division discards the fraction).

Skills Covered

- Integer Arithmetic
- Using the modulo and floor division operators

Deliverables

For this program, you will need to provide the Python file containing your code as well as a screenshot of the output of your program. Please name your files as follows:

- Python Files
    - lastname_firstname_filename.py
    - For example: **hawamdeh_faris_phone.py**
- Screenshots
    - lastname_firstname_filename.png
    - For example: **hawamdeh_faris_phone.png**

Program 2: grades.py

For your second program in today's lab, you will need to write a program that stores student's exam grades as a list and student attendance as a set. Use the attendance list and grades below. Your program will then need to print out the answers to the following questions:

1. Attendance
    a. How many students attended the class?
    b. Who attended both days of class?
    c. Who attended only one day of class?
2. Grades
    a. How many students took the exam?
    b. What was the highest exam grade?
    c. What was the lowest exam grade?
    d. What was the class average for the exam?

Report any floating-point values to 1 decimal place.

Attendance Sets

Day 1: William, Daphne, Erika, Adam, Percy, Brock, Jessica, Trent, Mahmoud

Day 2: Daphne, Alex, Percy, Mahmoud, Jessica, Adam, Trent, Caleb, Zayne, Erika

Grades List

Exam Grades: 88, 96, 96, 76, 89, 74, 100, 85, 75, 77, 100, 98

Example Terminal Output:

```
12 students attended the class.
{'Erika', 'Mahmoud', 'Trent', 'Adam', 'Daphne', 'Jessica', 'Percy'} attended both class days.
{'Zayne', 'Alex', 'Caleb', 'William', 'Brock'} attended one class day.

12 Students took the exam.
The highest grade was a 100
The lowest grade was a 74
The average grade for the exam was a 87.8
```

Skills Covered

- Lists and Sequence Methods
- Sets and Set Operations

Deliverables

For this program you will need to provide the python file containing your code as well as a screenshot of the output of your program. Please name your files as follows:

- Python Files
  - lastname_firstname_filename.py
  - For example: **hawamdeh_faris_grades.py**
- Screenshots
  - lastname_firstname_filename.png
  - For example: **hawamdeh_faris_grades.png**

Program 3: food.py

For your third program in today's lab, you will write a program that simulates a point-of-sale device for a restaurant. Your program will store the menu items and their prices as a dictionary. At the start of the program, it will display the menu items and their prices. Users will then be prompted for the quantity of each item on the menu. Finally, the program will calculate the total cost of the order.

Menu Item	Price
Hot Dog	$1.50
Slice of Pizza	$1.99
Whole Pizza	$9.95
Chicken Bake	$3.99
Soft Drink	$0.69
Ice Cream Sundae	$2.49

Each item should be stored in the dictionary using the name of the item as the key and the price as the value.

Example Terminal Output:

```
Menu
Hot Dog:            $1.50
Pizza (Slice):      $1.99
Pizza (Whole):      $9.95
Chicken Bake:       $3.99
Soft Drink:         $0.69
Ice Cream Sundae:   $2.49

Please enter the number of Hot Dogs: 1
Please enter the number of Pizza Slices: 2
Please enter the number of Whole Pizzas: 1
Please enter the number of Chicken Bakes: 2
Please enter the number of Soft Drinks: 6
Please enter the number of Ice Cream Sundaes: 2

The total cost of the order is $32.53
```

Skills Covered

- Creating and Accessing Dictionaries

Deliverables

For this program you will need to provide the python file containing your code as well as a screenshot of the output of your program. Please name your files as follows:

- Python Files
    - lastname_firstname_filename.py
    - For example: **hawamdeh_faris_food.py**
- Screenshots
    - lastname_firstname_filename.png
    - For example: **hawamdeh_faris_food.png**