Lab Assignment Week 05

CSC/DSCI 1301 – Principles of CS/DS I

Week of February 10th, 2025

Introduction

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

- Creating if-elif-else statements
- Creating nested if-statements
- Writing Conditional Expressions
- Using Logical Operators
- Using the Membership Operator

Lab policy reminders:

- Attendance is mandatory.
- Labs must be completed **individually.**
- TAs are here to help you. Ask them for help!
- Lab assignments are due at the end of each lab.

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 three programs in the lab
2. Screenshots of program output for all three programs

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

Program 1: speeding.py

Write a program that is given two integers representing a speed limit and driving speed in miles per hour (mph) and outputs the traffic ticket amount.

Speed Conditions:

1. Driving 10 mph under the speed limit (or slower) receives a $50 ticket.
2. Driving 6 - 20 mph over the speed limit receives a $75 ticket.
3. Driving 21 - 40 mph over the speed limit receives a $150 ticket.
4. Driving faster than 40 mph over the speed limit receives a $300 ticket.
5. Otherwise, no ticket is received.

Example Output

```
Please enter the speed limit for the road: 30
Please enter the vehicle's recorded speed: 45
The speeding fine is $75.
```

```
Please enter the speed limit for the road: 60
Please enter the vehicle's recorded speed: 55
There is no fine.
```

Skills Covered

- Creating if-elif-else statements
- Writing Conditional Expressions

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_speeding.py**
- Screenshots
  - lastname_firstname_filename.png
  - For example: **hawamdeh_faris_speeding.png**

Program 2: interstate.py

Primary U.S. interstate highways are numbered 1-99. Odd numbers (like the 5 or 95) go north/south, and evens (like the 10 or 90) go east/west. Auxiliary highways are numbered 100-999, and service the primary highway indicated by the rightmost two digits. Thus, I-405 services I-5, and I-290 services I-90. Your program must also be able to detect invalid highway numbers. Note: 200 is not a valid auxiliary highway because 00 is not a valid primary highway number.

```
Please enter an interstate number:200
200 is not a valid interstate highway number.
```

Given a highway number, indicate whether it is a primary, auxiliary highway, or an invalid highway number. If auxiliary, indicate what primary highway it serves. Also, indicate if the (primary) highway runs north/south or east/west.

Example Output

```
Please enter an interstate number:285
I-285 is auxiliary, serving I-85, going north/south.
```

```
Please enter an interstate number:85
I-85 is primary, going north/south.
```

Skills Covered

- Creating if-elif-else statements
- Creating nested if-statements
- Writing Conditional Expressions
- Using Logical 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_interstate.py**
- Screenshots
  - lastname_firstname_filename.png
  - For example: **hawamdeh_faris_interstate.png**

Program 3: membership.py

Write a program that determines whether a given character is a vowel, consonant, digit, or punctuation.

Create a list for each non-consonant character type:

1. Vowels – [‘a’, ‘e’, ‘i’, ‘o’, ‘u’]
2. Digits – [‘0’, ‘1’, ‘2’, … ‘9’]
3. Punctuation – [‘,’, ‘;’, ‘.’, ‘?’, ‘!’]

Prompt the user to enter a character and use the ***in*** membership operator to create if-elif-else statements that check if the entered character is in one of the lists above. Print out a message stating if the entered character is a vowel, consonant, digit, or punctuation.

Case Insensitivity: Consider making the program case-insensitive. Before checking, you can use the lower() string method to convert the input letter to lowercase. Ex. var.lower()

Example Output:

```
Please enter a character: i
The character 'i' is a vowel

Please enter a character: k
The character 'k' is a consonent
```

```
Please enter a character: 7
The character '7' is a digit

Please enter a character: ?
The character '?' is punctuation
```

Skills Covered

- Creating if-elif-else statements
- Writing Conditional Expressions
- Using the Membership Operator

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_membership.py**
- Screenshots
  - lastname_firstname_filename.png
  - For example: **hawamdeh_faris_membership.png**