COSC 1336 Homework 7

Relevant reading: Section 8.8, Chapter 9

Due: Nov. 29, 2:30 pm

(Late date: Dec. 6, 2:30 pm)

40 Points

Two-dimensional lists

Problem 1. [**10 points**]

a. Which of the following creates a four-row, two-column list named `quantities`, which contains all zeros?

   a. `quantities = [[0, 0], [0, 0], [0, 0], [0, 0]]`
   b. `quantities = [[0, 0, 0, 0], [0, 0, 0, 0]]`
   c. `quantities = [[0, 0, 0], [0, 0, 0], [0, 0, 0], [0, 0, 0], [0, 0, 0]]`
   d. `quantities = [4][2]`

b. Write a Python expression that prints the first element of the first row in the `quantities` list from the previous problem.

c. Write a Python expression that stores the value of the second element in the third row of the `quantities` list in a variables named `q`.

d. Write a Python expression that stores the value 12 in the first element in the last row of the `quantities` list.

e. How many elements are contained the list created with the following line of Python code?

```
sales_data = [[0 for i in range(5)] for j in range(9)]
```

f. How many rows does the `sales_data` list from the last problem have?

g. If the following two lines are executed, what are the contents of the `data` list?

```
data = [[0 for i in range(2)] for j in range(3)]
data[0][0] = 15
```

h. If the following two lines are executed, what are the contents of the `data` list?

```
data = [[0]*2]*3
data[0][0] = 15
```

i. Given the following "constant" variables, write a Python statement that creates a two-dimensional array of integers called `numbers` that has 10 rows and 12 columns, and initially stores all zeros. Then write a statement that stores the value 27 in the last column of the last row of the array. Be sure to use the `NUM_ROWS` and `NUM_COLS` constants wherever relevant. **Remember that array indices always start at zero!**.

```
NUM_ROWS = 10
NUM_COLS = 12
```

Problem 2. [**4 points**] Given the following code that creates a two-dimensional list, write the Python code that will display each element of the list. Format the output so that the elements in each row are separated by spaces, and each row is displayed on a separate line.

```
NUM_ROWS = 5
NUM_COLS = 8
data = [[0 for c in NUM_COLS] for r in NUM_ROWS]
```

Problem 3. [**6 points**] Given the following code to create a two-dimensional list, write Python code to display the sum of each of the **columns** in the `account_yields` list.

```
NUM_ROWS = 10
NUM_COLS = 30
account_yields = [[random.random() for i in range(30)] for j in range(10)]
```

Strings

Problem 4. [**6 points**] For each of the following, say exactly what will be displayed when the code is executed

Problem 4.
```
mystr = 'yes'
mystr += 'no'
mystr += 'yes'
print(mystr)
```

Problem 4.
```
mystr = 'abc' * 3
print(mystr)
```

Problem 4.
```
mystr = 'abcdefg'
print(mystr[4:-1])
```

Problem 5. [**10 points**] For each of the following, write the described statement(s). In many cases there are multiple ways to solve the problem, so any statement that behaves correctly is correct.

a. Write a Python statement that prints everything but the first and last characters of the string variable `word`.

b. If the string variable `name` contains `"Washington, George"`, write a Python statement that causes the comma to be removed from the `name` variable's contents.

c. Write Python code that makes a copy of the string variables `sentence` with all occurences of the lowercase letter `"t"` converted to uppercase.

d. Write a Python statement that makes the string variables `guess` be a string that has the same length as the string variable `word`, but containing only dash characters (`-`).

e. Write a Python statement that replaces the character at position 4 in the variable `guess` with an `"a"`.

f. Write a Python statement that gets the index of the first occurrence of `"a"` in the string `word` and stores it in a variable named `index`

g. Write a Python statement that replaces the character at the position indicated by `index` in the string variables `guess` with an `"a"`.

h. Assume the string variable `days` has the value `"Monday Wednesday Friday"`. Write a Python statement that splits the string, creating the following list:

```
["Monday", "Wednesday", "Friday"]
```

i. Assume the string variable `data` has the values `"Rogers#Ginger#1324534#Active"`. Write a Python statement that splits the string, creating the following list:

```
["Rogers", "Ginger", "1324534", "Active"]
```

j. Assume the string variable `data` has the values `"Rogers#Ginger#1324534#Active"`. Write a **single** Python statement that assigns the variables `last`, `first`, `idnum`, and `status` to be `"Rogers"`, `"Ginger"`, `"1324534"`, and `"Active`, respectively.

Problem 6. [**4 points**] In the past, if we wanted to test that a user's input was a particular string, but we didn't care about case, we might write an expression like the following to use as a condition:

```
color == "blue" or color == "BLUE" or color == "Blue"
```

a. [**2 points**] Write an expression that uses the `lower` function to convert the user's input (stored in the `color` variable) to be lowercase, and then make the one necessary comparison to have the same functionality as the expression above.

b. [**2 points**] Now write a compound condition that allows the same inputs as the previous one, but also allows the user to enter just the single letter `"b"` or `"B"`.