March 11
Weight: 20%

QUIZ

Part One: Programming Questions

QUESTION ONE: String Rearrangement (5 points)

Write a program that will take some string as an input and as well an array of integer that is the same length as the string. Following this, the string will be re-arranged such that the character at the nth position will move to the position n of the newly arranged string which is then returned to the user. For example:

Example:
Input string from user = "**abc**" and the array is [0, 1 , 2]
Then the output is simply "**abc**", each letter matches the correct position.

Example:
Input string from user = "**aaiougrt**" and the array is [4,0,2,6,7,3,1,5]
Then the output will be "**arigatou**"

Assume the user always enters a string and an array that are the same length, if there is a mismatch between the two lengths, simply continue to ask the user until they enter a string and array that are matching length.

QUESTION TWO: Sorted Arrays (5 points)

You are given three separate arrays of integers say **ar1**, **ar2** and **ar3** (all taken from the user). Each of these arrays are sorted in increasing order (i.e. 1,2,3 etc.). Create a program that will return a sorted array of only the integers that are present in each of the given arrays. For example:

Example:

Inputs from user: **ar1** = [1,2,3,4,5], **ar2** = [1,2,5,7,9] , **ar3** = [1,3,4,5,8]
Output from program: [1,5]
The numbers 1 and 5 appear in all three of the given arrays

Assume the user always gives a valid input with arrays that are already in increasing order (no need to sort them prior to implementing your algorithm)

QUESTION THREE: Array Neighbors (5 points)

Create a program that takes an array called **ar** as an input that keeps track of arrays. Every day a new array is produced using the array of the previous day. On the **n'th** day, the following operations are performed on the array of day **n – 1** to produce the array of day **n:**

-If an element is smaller than both left and right neighbor, then this element is incremented
-If an element is bigger than both its left neighbor and its right neighbor, then this element is decremented.
-The first and last elements should never change

Eventually after some days the array will not change, some examples:

Example:
Input from user: **ar** = [6,2,3,4]
Output from program: [6,3,3,4]
After the first day the array is changed from [6,2,3,4] to [6,3,3,4] and no further operations may be completed.

Example:
Input from user: **ar** = [1,6,3,4,3,5]
Output from program: [1,4,4,4,4,5]

After the first day the array is changed from [1,6,3,4,3,5] to [1,5,4,3,4,5].
After the second day the array is changed from [1,5,4,3,4,5] to [1,4,4,4,4,5] and no further operations may be completed.

Part TWO: Multiple Choice (5 points)

Highlight one answer per question (.5 points per question)

1) Which of the following properly determines the number of items in object x ?

a) len(x)
b) count(x)
c) x.len()
d) x.length()
e) None of the above

2) Which character can be used to split a statement over multiple lines?

a) /
b) ;
c) \
d) :
e) None of the above

3) Which of these literal forms will result in a syntax error?

a) a = [1,2,3,4]
b) a = [1,2, “four”]
c) a = [1 2 4]
d) a = [1, 2, 4]
e) None of the above

4) What is the result of the following expression: “12” + “34”

a) “12+34”
b) ‘1234’
c) It’s a syntax error
d) 46
e) 1234

5) What is the fundamental difference between a list and a tuple?

a) Lists can be nested, tuples cannot
b) Lists cannot be mutated, whiles tuples can
c) Lists can be mutated, while tuples cannot
d) Only list can be subclassed
e) Lists have no length limit

6) Is it possible to swap values of a and b using the following expression a, b =b , a

a) Yes but only for string variables
b) No
c) Yes but only for numeric values
d) It is always possible
e) None of the above

7) Which of the following incorporates a literal dictionary

a) my_dictionary = dict("a": 123, "b": "value", "c": "test")
b) my_dictionary = ("a": 123, "b": "value", "c": "test")
c) my_dictionary = "a" => 123, "b" => "value", "c" => "test"
d) my_dictionary = ["a": 123, "b": "value", "c": "test"]

8) Why do we need nested **if** conditions?

a) Nested if helps in executing commands even if the parent condition is not passed
b) To check for a sequence of conditions before a statement is executed
c) Nested if condition lets us create an else statement
d) Nested if checks all the elif statements regardless of its True or False
e) None of the above

9) What is the output of the following program?

```
def func(a,b,c):
    print(a,b,c)
```

a) 0,0,0
b) No output, function has not been called
c) 1,2,3
d) Error because the function hasn't been called
e) None of the above

10) What is the purpose of using a function in a program?

a) To create blocks of code for reusability
b) To execute a certain existing mathematical expression
c) To use looping structures
d) To import code from other sources
e) None of the above