Flipped IN-CLASS Lesson Plan Template

Topic or concept: For Loops in Python – Introduction to a fundamental structure common to most programming languages, as applied in the programming language, Python.

Basic objectives for preparatory work:	Advanced objectives for classwork & after class work:
1. Student will list the purpose and benefits of for-loops 2. Student will recognize the basic structure of for loops in python when used to display every element in a string	1. Student will apply the basic structure of Python for loops to display elements of containers other than strings, specifically lists and tuples. 2. Student will apply python for loops to display container elements in reverse 3. Student will demonstrate the ability to change program outputs using indentation in python for loops 4. Student will decide between using for loops vs. while loops for a given set of business problems

	Time planned	Activity and rationale	Resources needed
Beginning of class period	5 mins	Brain Dump of: 1. Purpose and benefits of for-loops 2. Basic structure of Python for-loops when displaying elements of a string Using clicker system with phones to have entire class answer five questions on the assigned e-book readings	Nearpod or Kahoot! Zybook online interactive book, Introduction to Business Programming, customized for the class Class projection system

	Time planned	Activity and rationale	Resources needed
		regarding the above concepts	
Middle of period	10 mins	Mini-lecture on using for loops with lists and tuples to gradually extend and apply readings on for loops with strings. Demonstrate the impact of indentation on program output. Students follow along with Professor to build/edit simple code examples	Powerpoint Slides Class projection system Code demo with Spyder Integrated Developer Environment
Middle of period (use if needed)	20 mins	Turn and Talk to discuss code solutions to simple for-loop coding problems. Write solutions on white board and report out on code solutions by student pairs	Powerpoint slide and projection system to project coding problems Zylab platform to test out code being developed using the following instructions (each student pair will take on 1-2 of these, advanced students may do all 4): 1. Display the words Go Warriors! vertically on screen 2. Display the word Hello World on screen one letter at a time. After you have displayed each element, print the following on screen: The End! 3. Display the list with the following elements 1,2,3,4 one element at a time 4. Display the tuple with the following elements a,b,c,d one element at a time after you have displayed the elements, display the following on screen: I know my a b c's!

	Time planned	Activity and rationale	Resources needed
Middle of period (use if needed)	30 mins	Complete in class coding exercises (zylab 5.2) using for-loops to display various containers. Collaboration with peers on coding solutions encouraged	Zylab platform to develop code and get formative feedback on potential logic and syntax errors for the exercises found in Appendix 1.
End of period	10 mins	Summarize for-loop code structures and present homework problem	Zylab platform to demonstrate solutions and display instructions for homework

Flipped AFTER CLASS Work Plan Template

Advanced learning objective	Activity and rationale	Instructions to students

1. Student apply python for loops to display container elements in reverse
 	
2. Student will change program outputs using indentation in python for loops
 	
3. Student will decide between using for loops vs. while loops for a given set of business problems
	1. Tweet what you learned to reinforce student memories of course materials
	
	2. HW problem: Debug code which applies lessons from the class (e.g. for loops displaying strings, lists, and tuples)
	
	3. Read and complete activities for zybook sections
	
	4. Create a class problem which displays a container in reverse
		1. Go to the class twitter page and summarize what you learned today in a tweet, read your classmates' tweets and make one comment
		
		2. Go to zylab 5.3 and use the interactive system to debug and submit the following code:
		a. for a in hello
		   print(a)
		b. for x in [a,b,c,d,e]
		   print x
		
		3. Read and complete the participation and challenge activities for zybook sections 5.5 and 5.7
		
		4. Based on the readings and activities in

Advanced learning objective	Activity and rationale	Instructions to students
		#3 create a coding problem that requires display of a list in reverse. Upload this problem to the CANVAS quiz named forloopReverse

Class: Bus4 92 For-Loops
Date assigned: 10/5/2019
Date due: 10/11/2019
Time estimate to complete this assignment:

Overview/Introduction

This lesson gives student an introduction to a fundamental structure/pattern in most programming languages, for-loops. This is an essential structure to learn as it reduces the programming effort and complexity associated with the repetition of tasks and corresponding code in a given application. Students will gain hands-on experience with the use of for-loops in the python programming language.

Learning Objectives

Basic objectives

List 3-5 learning objectives that you expect students to be able to master on their own before class.

1. Student will list the purpose and benefits of for-loops

2. Student will recognize the basic structure of for loops in python when used to display every element in a string

3. Student will demonstrate ability to differentiate between a string, list, and tuple

Advanced objectives

List 3-4 learning objectives that you expect students to need help mastering.

1. Student will apply the basic structure of Python for loops to display elements of containers other than strings, specifically lists and tuples.

2. Student will apply python for loops to display container elements in reverse

3. Student will change program outputs using indentation in python for loops

4. Student will demonstrate the ability to decide between using for loops vs. while loops for a given set of business problems

Preparatory Activities and Resources:

1. Do the following before class. This is due at 9am on 10/11/2019
   a. Read and complete the following exercises in chapter 5.5 of the class zybook: Basics, including Participation Activity 5.5.1 and Figure 5.5.2.
   b. Complete and submit zylab 5.1 to review strings, tuples, and lists.
      (The following instructions will be found in the online zylab platform as zylab 5.1):
      #1. assign the string 66 to the variable name z, convert it to a float & assign to z, then display the value assigned to z
      #2. assign the list 5,4,3,2,1 to the variable name a, convert it to a tuple & assign to a, then display the value assigned to a
      #3. assign the tuple a,b,c,d,e to the variable name b, convert it to a list & assign to b, then display the value assigned to b

2. Here are some resources you can use to help with your class prep.
   a. Refer back to zylab sections 3.1,3.2, and 3.3 to review the differences between strings tuples and lists, as needed.
   b. See a for-loop in action by doing the following:
      i. Go to the following link:
         http://www.pythontutor.com/visualize.html#mode=edit
      ii. type in the following code in the editor (follow the exact syntax):
         for a in "hello":
             print(a)
      iii. After typing in the code, press the "Visualize Execution" button
      iv. On the next screen, keep pressing the forward button to advance the loop one iteration at a time. Observe what happen in the Print Output and Global Frame sections as you click the forward button. Note also what happens to the value of the variable "a"each time you click the forward button
      v. How many times did you have to click the forward button to get the entire word, hello, in the print screen?

Exercises: Please complete by 9am on 10/11/2019.

1. Complete and submit zylab 5.1 using the zybooks platform. You will have an unlimited number of submissions to complete this work by 9am on 10/11/2019.
2. Complete exercise 2B above and type your answer to question v in the class twitter

Questions?

Contact me or the class teaching assistant via CANVAS email with any questions. You can also visit the Bus92 tutor in the Jack Holland Student Success Center, BBC008 (www.sjsu.edu/lcobssc)

ADVANCED PRACTICE

Class: Bus4 92 For-Loops
Date assigned: 10/11/2019
Date due: 10/16/2019
Time estimate to complete this assignment: 2 hours

Learning Objectives

Advanced objectives

1. Student will apply the basic structure of Python for loops to display elements of containers other than strings, specifically lists and tuples.

2. Student will apply python for loops to display container elements in reverse

3. Student will change program outputs using indentation in python for loops

4. Student will demonstrate the ability to decide between using for loops vs. while loops for a given set of business problems

Activities & deliverables

1. Go to the class twitter page and summarize what you learned today in a tweet, read your classmates' tweets and make one comment (Complete by EOD 10/11/2019)

    Complete the following by 9am on 10/16/2019

2. Go to zylab 5.3 and use the interactive system to debug and submit the following code:
    a. for a in hello
       print(a)
    b. for x in [a,b,c,d,e]
        print x

3. Read and complete the participation and challenge activities for zybook sections 5.5 and 5.7

4. Based on the readings and activities in #3 create a coding problem that requires display of a list in reverse. Upload this problem and its solution to the CANVAS quiz named forloopReverse

Resources:

1. Test the solution you developed in the #4 activity above using one of the following tools:
   a. http://www.pythontutor.com/visualize.html#mode=edit
   b. iPython console of the spyder IDE
2. Refer back to zylab sections 3.1,3.2, and 3.3 to review the differences between strings tuples and lists, as needed.

Questions?

Contact me or the class teaching assistant via CANVAS email with any questions. You can also visit the Bus92 tutor in the Jack Holland Student Success Center, BBC008 (www.sjsu.edu/lcobssc)

Appendix A. Zylab 5.2 (note, the # symbol before each line is used so that the zylab system will interpret these as instructions/comments and not code)

#Exercise 1 -- iterating through a list

#Assign the following as a list to the variable name user_int: 10,9,6,3,5,6

#Use a for loop to iterate across the list one element at a time,

#assigning each element to variable name num in each iteration

#Within each iteration, display the element assigned to num on screen

#After all the iterations are done, print the following on screen: Finished!

#Exercise 2 -- iterating through a tuple

#Assign the following as a tuple of strings to the variable name user_string: a,b,c,d,e,f

#Use a for loop to iterate across the tuple one element at a time,

#assigning each element to variable name letter in each iteration

#Within each iteration, display the element assigned to letter on screen

#After all the iterations are done, print the following on screen: Done!

#Exercise 3 -- iterating through a string

#Assign the following as a string to the variable name user_name: Valerie

#Use a for loop to iterate across the string one element at a time,

#assigning the element to name_letter in each iteration

#Within each iteration, display the element assigned to name_letter on screen

#After all the iterations are done, print the following on screen: The End!