Week: 04 Date: 02/25/2021

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| 15-110 Recitation Week 4 |

# **Reminders**

* HW2 due Monday 3/1 @ Noon EDT
* Check2 and HW2 resubmissions are due Tuesday 3/9 @ Noon EDT
* Recitation feedback form: <https://forms.gle/WKrrbawKktmRu1xp9>

# **Overview**

* While loops
* For Loops
* Strings

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| Problems |

**While Loops vs. For Loops + Q/A**

For loops! These allow you to set a specific range of values to iterate through ahead of time:

* General format: for i in range(x, y, z):
	+ i → iterator variable - contains current value of iteration
	+ range(x,y,z) → start value, end value, step size
		- Start value is inclusive, end value is exclusive

For loop example:

for i in range(0,10,2):

 print(i)

Now recall an example of a similar while loop:

i = 0

while i <= 10:

 print(i)

 i += 2

**Note:** these two examples are not equivalent! The for loop will not print 10, need to increase the end value to greater than 10. Also after the while loop, the value of i will be 12, whereas after the for loop (without changing the end value), the value of i will be 8.

While vs For Loops:

* For loops are used for a fixed number of iterations, help you avoid infinite loops
* While loops require declaring an iterator variable outside the loop and updating that variable within the loop. That is abstracted away in for loops by using range()
* While loops are more versatile, condition statement gives you more flexibility
* You can write any for loop as a while loop!

# **Binary + For Loop Code Trace**

Trace through the function calls below and identify the print output.

def f(n, bits):

 maxValue = 2\*\*bits - 1

 if (n > maxValue):

 return 'Not enough bits!'

 result = ''

 for k in range(bits-1, -1, -1):

 kthBit = n // 2\*\*k % 2

 result = result + str(kthBit)

 return result

print(f(3,4)) Print Output:

print(f(6,4)) Print Output:

print(f(16,4)) Print Output:

# **Quick String Questions**

Given the string s = “abcdefghi”, answer the following short answer questions:

1. How do I access the character “i” from string s?

Answer:

1. How do I create a string x which is equal to “cdef” using s?

Answer:

1. How do I create a string x which is equal to “beh” using s?

Answer:

1. How do I create a string x which is equal to the reverse of s?

Answer:

1. How can I check if the string “deg” is in s, and what does this expression evaluate to?

Answer:

1. How can I check and see if string x = “abcdef” is lexicographically greater than s, and what does this expression evaluate to?

Answer:

# **Strings Functions Code Writing**

**Recall that we have the following string functions:**

* ord and chr → ASCII value of character and vice versa
* Boolean Information: s.isdigit(), s.isupper(), s.islower()
* Numerical Information: s.count(c), s.find(c)
* Creating New Strings: s.upper(), s.lower(), s.replace(a,b), s.strip()

Write a function everyOther that takes in a string s and prints every other letter, converting the letter to lowercase before printing if it is currently uppercase. You can assume that the string s contains only alphabetical characters.

**Hint before you begin:** which string function would you want to use to help with this?

Function:

code

Write a function printLowercase(s) that takes in a string s and adds all lowercase letters to a new string which it then returns. You can assume that the string s contains only alphabetical characters.

**Hint before you begin:** which string function would you want to use to help with this?

Function:

code