Week: 03 Date: 02/18/2021

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| 15-110 Recitation Week 3 |

# **Reminders**

* Check2 due Monday 2/22 @ Noon EDT
* Check1 and HW1 resubmissions are due Tuesday 2/23 @ Noon EDT
* First Quiz is Wednesday 2/24!
* Small groups for homework and quiz! Link a when2meet/Google form for student availability
* Recitation feedback form: <https://forms.gle/WKrrbawKktmRu1xp9>

# **Overview**

* If/Elif/Else statements, nested if statements
* Circuits and gates
* While loops

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| Problems |

**Practice with Boolean Expressions**

You are at Disneyland, but each ride has its own restrictions. Write a boolean expression based on the ride’s requirements. For example:

Splash Mountain: the water level (level) must be an even depth or the weather (weather) must not be rainy or snowy.

Boolean Expression:

Mad Tea Party (the spinning cups): the sum of the weights of the three people (x\_weight, y\_weight, z\_weight) in the teacup must be no larger than 700 lbs. Additionally, the number of children (child) should be no more than twice the number of adults (adult).

Boolean Expression:

Space Mountain: you must be in between the age (inclusive) of 4 and 65 (age) and not pregnant (pregnant).

Boolean Expression:

Pirates of the Carribean: your “argh matey” levels (AM) must be larger than 100 (AM) or an odd number.

Boolean Expression:

# 

# 

# 

# **Control Flow to Code**

Convert this control flow chart into code!



# **Conditional Code Trace**

Trace through the following function on the given input below.

def f(a, b, c):

result = 'A'

if (a > b):

result += 'B'

elif (b > c):

result+='C'

if (a % c != 1):

result += 'D'

else:

result += 'E'

result += 'F'

return result

print(f(1,2,3), f(2, 3,1))

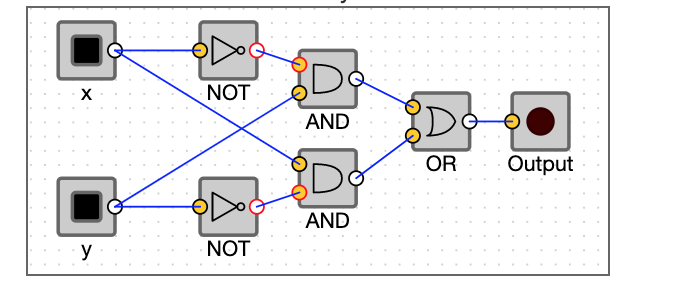
Print Output:

How can we write this print check as assert statements instead?

Assert Statements:

# **CIRCUITS AND GATES**

Fill out the Truth Table and complete the Boolean Expression below based on the following circuit.



**Truth Table:**

|  |  |  |
| --- | --- | --- |
| x | y | output |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Boolean Expression:**

**Bonus:** What gate is this circuit equivalent to?

# **HasIncreasingDigits**

**While Loop Notes:**

Key features:

* Iterator variable declared outside of loop
* Loop condition - must evaluate to False at some point, otherwise infinite loop!
* Update iterator variable within loop

Important notes:

* While loops require declaring an iterator variable outside the loop and updating that variable within the loop.
* A while loop’s condition must evaluate to False at some point, otherwise, you will have an infinite loop!

Write a function hasIncreasingDigits that returns whether or not an number has all increasing digits (from left to right)  
hasIncreasingDigits(1234) -> True  
hasIncreasingDigits(77)-> False  
hasIncreasingDigits(56734)->False

Code: