15-110 Hw2 Check-in - Written Portion

Name:

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#1 - Code Tracing Conditionals - 15pts

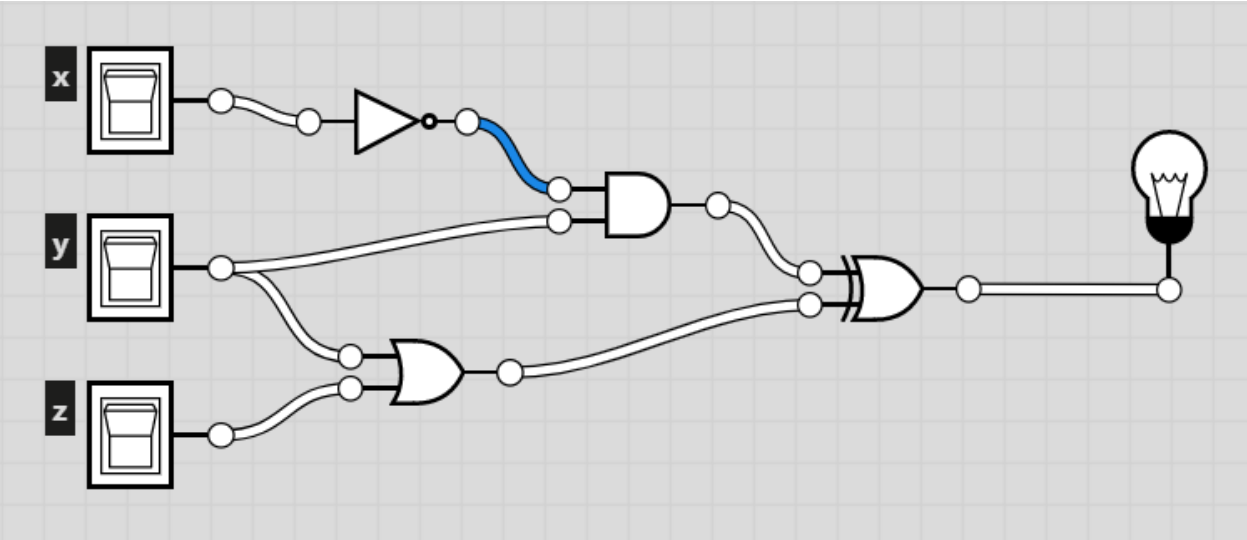
Given the following block of code, give a specific value for x, y, and z that would lead to the code printing A, B, C, D, or E. Fill out your answers in the table below.

```
if x < 10:
    if y > 20:
        if z == "foo":
            print("A")
    else:
        if y % 2 == 0:
            print("B")
        else:
            print("C")
elif x < 100:
    if y < 0 and z == "bar":
        print("D")
    elif y < 0:
        print("E")
```

Printed Result	x value	y value	z value
A			
B			
C			
D			
E			

#2 - Circuit to Truth Table - 20pts

Starting with the circuit shown below, fill out a truth table below that shows all possible input combinations and all the resulting outputs for the circuit. You may not need to use all the given rows.



x value	y value	z value	output value

#3 - Full Adder Facts - 10pts

In class and in the lecture slides, we showed how to put together a Full Adder circuit. For each of the following questions, choose the best answer as relates to that circuit.

What are X and Y?

- ❑ The two numbers being added
- ❑ Single binary digits of the two numbers being added
- ❑ Two binary digits of the first number being added
- ❑ The two output values

What is C_{in}?

- ❑ The third whole number being added
- ❑ A single binary digit of the third number being added
- ❑ The number carried in from the previous addition
- ❑ The number carried out from the current addition

Why do we need two output values?

- ❑ To hold both the result and the number that will be carried over
- ❑ To manage the large number of gates
- ❑ To account for both of the inputs
- ❑ To allow the result to be saved over time

#4 - Debugging While Loops - 15pts

Given the following block of code, fill out a debugging table that shows the values of the variables at the **end** of each iteration of the loop. You may not need to fill out values for every listed iteration.

```
x = 0
y = 10
z = 0
while x < y:
    x = x + 3
    y = y + 1
    z = (x + y) - z
    print(x, y, z)
```

	x value	y value	z value
Pre-loop	0	10	0
Iter 1			
Iter 2			
Iter 3			
Iter 4			
Iter 5			
Iter 6			
Iter 7			
Iter 8			

Programming Problems

Each of these problems should be solved in the starter file available on the course website. They should be submitted to the Gradescope assignments Hw2 Check-In (Programming) to be autograded.

Both programming problems may also be checked by running the starter file, which calls the function testAll() to run test cases on both programs.

#5 - intSign(x) - 20pts

Write a function, intSign(x) that takes a number x and returns a string representing its sign (“positive”, “negative”, or “zero”). You may assume x will be an int or a float.

#6 - Flow Chart to Program - 20pts

Given the control flow chart shown below, write a function, mysteryFunction(a, b, c), that implements the control flow chart correctly.