

Name: _____ Section: ____ Andrew Id: _____

15-110 Spring 2019 Quiz3

* **30 minutes, No calculators, no notes, no books, no computers, no phones**

* Do not assume the size of the canvas. Use data.width and data.height.

* Make reasonable assumptions about anything not explicitly stated here.

* To save time, you may write d.foo instead of data.foo, and e.foo instead of event.foo

1. **Code Tracing [10 pts]** Indicate what the following program prints. Place your answer in the box.

```
def ct1(s):
    t = ''
    for c in s:
        if ((c.isdigit() == True) and
            (int(c)%2 == 1)):
            t += c
    return t
print(ct1('I had 253 dogs and 762 cats!'))
```

2. **Code Tracing [10 pts]** Indicate what the following program prints. Place your answer in the box.

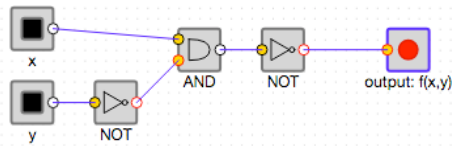
```
def ct2(s):
    for i in range(len(s)):
        c = s[i]
        d = s[len(s)-1-i]
        if (int(c) - int(d) != 1):
            return i
    return -1
print(ct2('578364'))
```

3. **Code Tracing [10 pts]** Indicate what the following program prints. Place your answer in the box.

```
def ct3(n):
    s = '1'
    m = 2
    while(int(s) < n):
        s += str(m)
        m *= 2
    return s
print(ct3(42))
```

4. **Logic Circuits and Truth Tables [10 pts; 2.5 pts each value]**

Given this circuit:



Fill out this truth table for $f(x,y)$:

x	y	$f(x,y)$
0	0	
0	1	
1	0	
1	1	

5. **Fill in the Blank [10 pts]**

- If a function does not have a return statement, by default it returns _____.
- If s is a string, we can't set $s[0]='a'$ because strings are _____.
- In lecture, we wrote a logic circuit that added two one-bit numbers x and y , producing a two-bit result. For the 2's digit (the left digit) of that result, we used a(n) _____ gate.
(hint: the answer is one of AND, OR, NOT, XOR, NAND, NOR, NXOR)

6. **Free Response: duplicateVowels(s) [20 pts]**

Write the function `duplicateVowels(s)` that takes a string s and returns a new string where each vowel in s is duplicated (where the lower-case vowels are 'aeiou'). Also, preserve case, so upper-case letters stay upper-case, and lower-case letters stay lower-case. For example:

```

assert(duplicateVowels('Go Team ABC') == 'Goo Teeaam AABC')
assert(duplicateVowels('ab aa Ee') == 'aab aaaa EEee')
  
```

7. **Free Response: red cat animation [30 pts]**

Starting from our starter code, write `init`, `keyPressed`, and `drawAll` so that:

- a. The app just draws one string, centered in the canvas, which starts out as 'c'
- b. When a letter is pressed, it is added (in lowercase) to the end of the string. So if 'A' is pressed, 'a' is added to the end of the string.
- c. Non-letters are ignored.
- d. The entire string is blue unless it contains the word 'cat', in which case the entire string is red (and remains red from then onwards).

8. **Bonus Code Tracing [2 pts]** Indicate what the following program prints. Place your answer in the box.

```
def bonusCt(n):  
    t = str(n)  
    m = 2  
    for i in range(255, 0, -1):  
        if (0 < i - ord(str(n)) < n):  
            t += chr(i) * m  
            m += 1  
    return t  
print(bonusCt(4))
```

