15-110 - Quiz1 - 09/22/2021

Name: _____ andrewID: _____

- This quiz tests material from weeks 1-2 of the course.
- You have **20 minutes** to take the quiz.
- If you have a clarification question, raise your hand and a proctor will come help you.
- You must complete the quiz **individually**. You may refer to paper notes during the quiz, but do not communicate with anyone else.

1. Function Definitions - Code Writing [35pts]

Write the function `randomlyClose(cutoff)`. This function takes an integer `cutoff` as a parameter, then generates two random numbers (each in the range [1, 100], inclusive). If the difference between those two numbers is less than or equal to the given cutoff, the function should return `True`; otherwise, it should return `False`.

Clarifying examples:

- If the function was given a cutoff of 20 and randomly generated integers 88 and 93, it would return `True` (the difference between 93 and 88, 5, is less than 20)
- If it was given a cutoff of 50 and generated the numbers 11 and 81, it would return `False` (the difference between 81 and 11 is 70, larger than 50).
- If it was given a cutoff of 40 and generated the numbers 59 and 19, it would return `True` (the difference between 19 and 59 is exactly 40).

Hint: the built-in function `abs` and the random library function `randint` may come in handy here. You should *not* assume that any libraries have been imported already.

```
import random

def randomlyClose(cutoff):
    a = random.randint(1,100)
    b = random.randint(1,100)
    if abs(a - b) <= cutoff:      # OR return abs(a - b) <= cutoff
        return True
    else:
        return False
```

2. Function Calls - Code Reading [30pts]

Consider the following code:

```
x = 10

def funA(w):
  w = w * 3
  y = -w + 2
  print("funB:", abs(funB(y)))
  return w

def funB(x):
  tmp = x
  x = "awesome"
  x = funC(x)
  return tmp

def funC(a):
  a = a +"!!"
  print("funC:", a)
  return a

result = funA(x)
print("Done!")
```

First, what will the entire code run print once it is finished executing? **Enter your answer in the space below.**

funC: awesome!!
funB: 28
Done!

List all the function calls that occur in this code run with their **name, argument(s),** and **returned value**. If there is no name / argument / returned value, leave the space blank.

Note: Do not include any calls to built-in functions in the table.

Function name	Argument(s)	Returned value
funA	x or 10	30
funB	y or -28	-28
funC	x or “awesome”	“awesome!!”

3. Data Types - Short Answer [15pts]

For each of the following expressions, what **value** does that expression evaluate to, and what is the **type** of that value?

```
1.5 * (2 + 3)
```

Value:	7.5
Type:	Float

```
(10 * 2) == (2 * 10)
```

Value:	True
Type:	Boolean

```
"High" + "Low"
```

Value:	“HighLow”
Type:	String

4. Binary Numbers - Short Answer [20pts]

For each of the following problems, you must show your work to receive full credit. For example, to convert 0101 to decimal, you could show 0*8 + 1*4 + 0*2 + 1*1 = 4 + 1 = 5.

Convert 101110 from binary to decimal.

Work	1*2^5 + 0*2^4 + 1*2^3 + 1*2^2 + 1*2^1 + 1*2^0 32 + 8 + 4 + 2
Answer	46

Convert 27 from decimal to binary.

Work	27 = 16 + 8 + 2 + 1 = 2^4 + 2^3 + 2^1 + 2^0
Answer	11011