## Control Flow and Iteration assessment in python 3.0+

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1. List three situations in which you would want to use an infinite while loop. Example:

while True:

pass

2. List three ways to exit out of a **while** loop?

3. The **pass** statement acts as a placeholder so it does nothing. What’s the point of including a pass statement in your code?

4. Is the truth table for the and statement the inverse of the truth table of the or statement.

5. Is the following always False? (P ∧¬ P)

In logic ∧ represents and, and ¬ represents negation.

6. Are the following tautologies or statements that’s always true? Verify this with python code.

a) P V ¬P

b) ¬ (P ∧ ¬P)

c) ¬¬P ↔ P

d) (P ∨ Q) ↔ (Q ∨ P)

e) (P ∧ Q) ↔ (Q ∧ P)

V in logic denotes or, and ↔ denotes *if and only if.*

7. What’s the difference between the following code snippet?

**Code snippet a:**

x = 5

**if** x < 5:

print(x)

**elif** x == 5:

print(x)

**elif** x >= 5:

print(x)

**code snippet b:**

x = 5

**if** x < 5:

print(x)

**if** x == 5:

print(x)

**if** x >= 5:

print(x)

8. The following is an example of a nested for loop:

>>> for x in range(1, 20):

... for y in range(1, 5):

... print(y, end=' ')

... print()

Answer the following questions:

a) Nested loops tend to have a quadratic time complexity which is Big O n2. Big O notation is commonly used to measure the algorithmic performance of computer programs. Is quadratic time complexity good or bad?

b) Write out the input of the loop by hand on a piece of paper. After done discuss your findings about the outer loop compared to the inner loop.

9. Fizz Buzz is a common interview question that’s used to filter out potential candidates during a coding interview. Write a Fizz Buzz implementation in python:

* Print out numbers from 1-100 (test edge cases)
* For multiples of 3 print *Fizz*
* For multiples of 5 print *Buzz*
* For multiples of 3 and 5 print *FizzBuzz*

Sample output:

Input 1 → output 1

Input 6 → output Fizz

Input 20 → output Buzz

Input 15 → output FizzBuzz

10. Write a simple program that satisfies the following criteria:

Given an integer n within the range of 1-100 perform the following conditional checks. Check edge cases:

if n is odd print *weird*

if n is even print *normal*

if n is within the range of 90-99 print *nada*