Lecture 3.1. Practice Questions

Q1.a. Factorials

In mathematics, the factorial of a non-negative integer ***n***, denoted by ***n!,*** is the product of all positive integers less than or equal to n.

n! = n * (n-1) * (n-2) * (n-3) * …. * 3 * 2 * 1

The value of 0! is 1.
The following code implements factorials for n from 0 to 5:

```
number    = 5
factorial = 1

if number > 0:
    factorial = factorial * number
    number = number - 1

if number > 0:
    factorial = factorial * number
    number = number - 1

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    factorial = factorial * number
    number = number - 1

if number > 0:
    factorial = factorial * number
    number = number - 1

if number > 0:
    factorial = factorial * number
    number = number - 1

print(factorial)
```

	number = 5			
Code Line #	Executed (Yes/No)	Condition (True / False)	factorial	number
4				
5				
6				
8				
9				
10				
12				
13				
14				
16				
17				
18				
20				
21				
22				
24	factorial =			

	number = 0			
Code Line #	Executed (Yes/No)	Condition (True / False)	factorial	number
4				
5				
6				
8				
9				
10				
12				
13				
14				
16				
17				
18				
20				
21				
22				
24	factorial =			

Q1.b.

```
1  number    = 5
2  factorial = 1
3
4  if number > 0:
5      factorial = factorial * number
6
7  if number - 1 > 0:
8      factorial = factorial * number - 1
9
10 if number - 2 > 0:
11     factorial = factorial * number - 2
12
13 if number - 3 > 0:
14     factorial = factorial * number - 3
15
16 if number - 4 > 0:
17     factorial = factorial * number - 4
18
19 print(factorial)
```

	number = 2			
Code Line #	Executed (Yes/No)	Condition (True / False)	factorial	number
4				
5				
7				
8				
10				
11				
13				
14				
16				
17				
19	factorial =			

Q.1.c. Change (fix) the code in Q1.b. (by marking up the code above) so the factorial variable is set to the correct value. Fill out the table below, after making the change:

	number = 2			
Code Line #	Executed (Yes/No)	Condition (True / False)	factorial	number
4				
5				
7				
8				
10				
11				
13				
14				
16				
17				
19	factorial =			

Q2. Quadratic formula is as follows:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

when $ax^2+bx+c=0$

Write, in Python, formula for both values of x, using a variable for each:
1) using +ve sign after -b
2) using -ve sign after -b

Also, give an appropriate name to the two x variables

1. _____

2. _____

Precedence	Left Operand	Operator	Right Operand
1			
2			
3			
4			
5			
6			
7			
8			
9			

Q3. A XOR B is defined as (A or B) and (not A or not B)

A	B	A or B	not A	not B	not A or not B	(A or B) and (not A or not B)
True	True					
True	False					
False	True					
False	False					