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1. func-4-5: Consider the following code:

```
def square(x):  
    for counter in range(x-1):  
        runningtotal = x  
        runningtotal = runningtotal + x  
    return runningtotal
```

What happens if you put the initialization of `runningtotal` (the line `runningtotal = x`) inside the for loop as the first instruction in the loop?

2. Rewrite the following problems using an indefinite while-loop: `factorial(n)`, `sumTo(n)`, `power(n,p)` `countVowels(word)`

<code>def factorial(n):</code>	<code>n!= 1*2*3* ... *n</code>
<code>def sumTo(n):</code>	<code>sumTo(n)= 1+2+3+ ... + n</code>
<code>def power(n, p):</code>	<code>power(n, p)= n*n* ... *n (p-times)</code>
<code>def countVowels(word):</code>	<code>countVowels("halloween") -> 4</code>

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3. Write a function to find greatest common divisor (GCD) or highest common factor (HCF) of two numbers. For example, $\text{gcd}(18, 12) = 6$

4. p9-1: What is the result of executing the following code?

```
number = 0
while number <= 0:
    if number < 0:
        number = number + 1
    print(number)
```

5. What is the following code going to print:

```
numbers = [3, 0, 2]
cnt = 0
for i in numbers:
    for j in range(i):
        print('iteration', cnt, end=': ')
        print(j)
        cnt = cnt + 1
```

6. What is the following code going to print:

```
numbers = [3, 0, 2]
cnt = 0
for i in numbers:
    cnt = 0
    for j in range(i):
        print('iteration', cnt, end=': ')
        print(j)
        cnt = cnt + 1
```

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7. What is the following code going to print:

```
numbers = [3, 0, 2]
cnt = 0
for i in numbers:
    cnt = cnt - 1
    for j in range(i):
        print('iteration', cnt, end=': ')
        print(j)
        cnt = cnt + 1
```

8. What does this following code print:

```
size = 2
for i in range(size+1):
    print("i", end=" ")
    for j in range(i):
        print("duck", end=" ")
    print("goose")
    print("--" + "-" * i)
```

9. Split the following code in 2 utility-function `get_month()` and `get_day()` and a `main()` function that gets the input from the user and does the printing:

```
date = input('Date: ') #January, 25
zodiac = input('Zodiac: ') #Rat
digits = ""
letters = ""
for char in date:
    if (char > '0' and char < '9'):
        digits = digits + char
    else:
        letters = letters + char
double = "20" * 2
print(digits, letters, double)
print("Year of the "+zodiac)
```

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10. What does this following code print:

```
for i in range(1,4):  
    print(i, 'produces', i ** 2)  
    for j in range(i ** 2, i, -2):  
        if (j % 3 == 0):  
            print(str(j) + ' is divisible by 3')  
        else:  
            print(str(j) + ' is not')  
    print('step i done')
```

11. Correct this following program so that it reads the first non-empty user input:

```
count=0  
user_input=input('type your input: ')  
while user_input == "" or count < 1:  
    count+=1  
    user_input=input('type your input: ')
```