Review for finals #3
Due Monday 5/24/21 by midnight

As you know, we are reviewing Python for two weeks. Your final exam will be on Python. Today we're going to review for loops and the modulo command.

for loops

A for loop iterates a list of items ("iterates" means "goes through a list"). For example, this code:

```
numList = [1,2,3,4]
for x in numList:
    print(x)
```

generates this output:

```
1
2
3
4
```

Here is another for loop, this time with a non-numerical list:

```
farmList = ["Goat","Pig","Chicken"]
for x in farmList:
    print(x)
```

The above code generates the following output:

```
Goat
Pig
Chicken
```

Finally, if you want to make a for loop and just have a number that goes up, one at a time, you can do the following. This code:

```
for x in range(0,5):
    print(x)
```

generates the following:

```
0
1
2
3
4
```

The following code prints out the farm animals but in a more complicated way than previous code I used above. See if you can understand it:

```
farmList = ["Goat","Pig","Chicken"]
for x in range(len(farmList)):
    print(farmList[x])
```

The above for loop uses the range call which puts the numbers from zero to 1 less than the length of the farmList variable into x, one at a time. It's definitely easier to just say "for x in farmList:" if you just want the items one at a time, but I wanted you to see all the options. Sometimes you need to know the index number of each item in a list.

That's it for **for loops**.

Now let's review the modulo operator

The modulo operator or % symbol divides one number by another <u>and gives you the remainder</u>. For example, 10%2 gives you 0 (10 divided by 2 gives you 5 evenly, that is, there is no remainder). 10%3 gives you 1, because when you divide 10 by 3 you end up with a remainder of 1.

Here we take user input (a number) and find all the factors of that number using the modulo operator (%). (Factors are numbers that divide into a number evenly. For example, 1, 2, 3, 4, 6, and 12 are all factors of 12.)

This code:

```
x = int(input("Please enter a number: "))
print("You entered",x)
print("We will now find all factors of",x)
for i in range(1,x+1):
    if x%i==0:
        print(i,"is a factor of",x)
```

generates:

```
Please enter a number: 48
You entered 48
We will now find all factors of 48
1 is a factor of 48
2 is a factor of 48
3 is a factor of 48
4 is a factor of 48
6 is a factor of 48
8 is a factor of 48
12 is a factor of 48
16 is a factor of 48
24 is a factor of 48
48 is a factor of 48
```

Today I would like you to do something similar to the program I just showed you:

- Create a program on repl called Review 3.
- Ask the user for a number (x)
- Ask the user for a second number (y) that is smaller than the first number
- If it is not smaller, start over
- Use one or more try/except structures to make sure that the user is actually entering a numbers for x and y above.
- Once you have the two numbers, make a for loop go from 1 to x
- Report all numbers less than x that are evenly divisible by y
- Report the count of how many numbers were found like this: "There are 6 numbers smaller than 43 divisible by 7"
- Finally, use the following list variable (copy it out of this PDF) to create output that looks like the output shown below. Hint: you will use a for loop, and a print call.

```
nums = [2, 4, 6, 7, 7, 8, 8, 8, 8, 9, 10, 10, 7, 8, 7, 6, 4, 3, 3, 3, 2, 2]
```

Sample output:

```
Please enter a number: 43
Please enter a smaller number: 7
7 is divisible by 7
14 is divisible by 7
21 is divisible by 7
28 is divisible by 7
35 is divisible by 7
42 is divisible by 7
There were 6 numbers less than 43 divisible by 7

And now a silhouette of a person:

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