

Homework 3
So Many Loops
Due October 8, 2021 at 5pm
(updated 10/4/21)

In this homework, you will be doing a series of exercises designed to make you practice using loops. Each one of these should be in a separate Python file. For this assignment, you may assume that all the input you get will be of the correct type.

Learning Goals

1. Create and use while loops.
2. Create and use for loops.
3. Use both loops over lists.
4. Identify and fix errors.

The Assignment

Write four small programs to do the following four tasks. For each program, you must prompt politely for input and print out the answer in an explanatory sentence. Each program you write **must** use a loop!

1. **hw3a.py** Write a small program that will prompt the user to enter a number repeatedly until they enter 'stop'. Your program should prompt the user for at least once. When 'stop' is entered, you should report out the largest number entered.

Sample output (user responses in bold):

```
Enter a number (or 'stop' to end): 2
Enter a number (or 'stop' to end): 4
Enter a number (or 'stop' to end): 5
Enter a number (or 'stop' to end): stop
The largest number is 5!
```

2. **hw3b.py**. Write a program that gets a number from the user and then prints the numbers from 0 up to that number (inclusive), one per line. However, there are six special cases where instead of printing the number, you print a message instead:

1. . If the number you would print is **divisible by 2**, print the message:
Too many bugs!
2. If the number you would print is **divisible by 5**, print the message:
Five basketball players on the court at a time.

3. If the number you would print is **divisible by 9**, print the message:
The Orono Farmer's Market starts at 9am on Saturday.
4. If the number you would print is **divisible by 125**, print the message:
COS 125 is the best course ever!
5. If the number you would print is **divisible by 2 and 5**, instead print out:
Decade!
6. If the number you would print is **divisible by 2 and 9**, instead print out:
Dressed to the nines.

Here is some partial sample output, showing from 0 up to 20.

```
bash-4.1$ python hw3b.py
How high should I count? 20
0
1
Too many bugs!
3
Too many bugs!
Five basketball players on the court at a time.
Too many bugs!
7
Too many bugs!
The Orono Farmer's Market starts at 9am on Saturday.
Decade!
11
Too many bugs!
13
Too many bugs!
Five basketball players on the court at a time.
Too many bugs!
17
Dressed to the nines.
19
Decade!
```

3. hw3c.py Examine the contents of a list, using `len()` and `range()`. Given a list, print out the element index and contents for each element. Your program should initialize the list of your choice and then print out the contents in the format specified. For example, given the list:

```
colors = [ "red", "yellow", "green", "brown", "scarlet", "black", "ochre", "peach", "ruby"]
```

Sample output would be:

```
The color list is:
```

```
1: red
2: yellow
3: green
4: brown
5: scarlet
6: black
7: ochre
8: peach
9: ruby
So many colors!
```

4. hw3d.py Write a small program that asks the user for two numbers (x, y). For each number from 1 to x (inclusive), print the first y multiples of that number on the same line. Keep repeating this action until the user inputs any negative number.

```
Hello, what are your numbers? 3 4
1 2 3 4
2 4 6 8
3 6 9 12
4 8 12 16 Update: this line should not appear
Hello, what are your numbers? 1 1
1
Hello, what are your numbers? 0 1
Hmmm. Nothing to see here.
Hello, what are your numbers? -1 1
Goodbye
```

How to turn in your homework

Turn in each program in its own file. When turning in your own assignment make sure to add your last name to the file name (for example: Rheingans_hw3a.py).