Homework 5: Functions and Conditionals

Due: Friday, Oct. 22nd by the start of class

General Instructions:

1. You may work in pairs of no more than 2 people. Only one person from your team should submit code on Blackboard.
2. You are expected to adhere to the collaboration policies as discussed on the class syllabus. The Emory Honor Code and the Math/CS Dept. Statement of Policy on Computer Assignments is in effect. I use cheating-detecting code to detect improper collaboration. Collaboration at a reasonable level will not yield substantially similar code.
3. For this assignment, you should use either the lab computers or python 2 (NOT python 3) installed on your personal computer.
4. On the lab computers, type "idle &" to get started. Click on File->New Window to get a window which you can run over and over.
5. The first lines of your file should include (as comments) a) your name b) the assignment number ("HW5" in this case), and c) your collaboration statement as outlined on the syllabus.
6. Save your file as lastname_hw5.py
7. Submit your assignment to the HW5 assignment on Blackboard.
8. Do not wait until the last minute to get started. Computers crash, wireless goes down, etc. Be prepared.

Specific Instructions:

You will write five python functions for practice with the language. Include each of the following functions in your file. Do not include calls to the functions; remove them (or comment them out) before submission. Be sure to capitalize the function names as they are listed below.

1. superman
2. largest
3. compliments
4. leapYear
5. comboLock

Function descriptions:

Function #1: superman

Parameters:

height - an integer representing the user's height in inches

Description:

Write a function for the Superman ride at Six Flags that determines whether the user is taller than 4'8" so that he or she can ride a roller coaster. If the user's height, which is provided by the parameter height, is greater than or equal to the minimum height, print the string 'Have a great ride!'. Otherwise, print the string 'Sorry. You must be at least 4 feet 8 inches to ride.'

Test Cases:

```
>>>superman(30)
Sorry. You must be at least 4 feet 8 inches to ride.
>>>superman(70)
Have a great ride!
```

Function #2: largest

Parameters:

num1 - a floating point number being compared against num2 and num3
num2 - a floating point number being compared against num1 and num3
num3 - a floating point number being compared against num1 and num2

Description:

Write a function that takes in three numbers as parameters and prints out the largest of the three. If two or all of the numbers are equal, or even all three, then just print the value once.

Test Cases:

```
>>>largest(433.1, 2340.32, 12323.7)
12323.7
>>>largest(12.0, 32.1, 32.1)
32.1
>>>largest(23.44, 23.44, 23.44)
23.44
```

Function Name: compliments

Parameters:

answer1 - a boolean (True or False) representing whether the user is "smart"
answer2 - a boolean (True or False) representing whether the user is "awesome"
answer3 - a boolean (True or False) representing whether the user is "fun"

Description:

Write a function that outputs a string of compliments based on the adjectives selected by the inputs. Use the inputs True and False. The function should return the string “You are” concatenated with the compliments that are true. The three compliments should be: "smart" "awesome" and "fun". If none of the compliments are true, print the string “Goodbye.” instead.

Test Cases:

```
>>>compliments(True, True, True)
You are smart awesome fun.
>>>compliments(False, True, False)
You are awesome.
>>>compliments(False, False, False)
Goodbye.
```

Function Name: leapYear

Parameters:

year – an non-negative integer representing the year

Test Cases:

```
>>>leapYear(1996)
The year 1996 is a leap year.  Enjoy your extra day!
>>>leapYear(1901)
The year 1901 is not a leap year.
```

Description:

Write a function which calculates whether or not a given year is a leap year and has 366 days instead of 365. A general algorithm is as follows:

1. A year will be a leap year if it is divisible by 4 but not by 100.
2. If a year is divisible by 4 and by 100, it is not a leap year unless it is also divisible by 400.

Years such as 1996, 1992, 1988 and so on are leap years because they are divisible by 4 but not by 100. For century years, the 400 rule is important. Century years (ex: 1900, 1800, 1700) are exactly divisible by 4 AND exactly divisible by 100. They are not divisible by 400 and are thus not leap years. You

fuction should print out "The year XXXX is a leap year. Enjoy your extra day!" if the year XXXX is a leap year or "The year XXXX is not a leap year." if the year XXXX isn't a leap year.

Function Name: comboLock

Parameters:

num1 – a positive integer representing the first digit in the combination
num2 – a positive integer representing the second digit in the combination
num3 – a positive integer representing the third digit in the combination
num4 – a positive integer representing the fourth digit in the combination
num5 – a positive integer representing the fifth digit in the combination

Description:

You own a combination lock that only opens when presented with the correct sequence of odd and even numbers that are less than 10. Write a function that takes in 5 integers. Check whether they are in this order: odd, even, odd, even, odd. If they are in the correct order and all below 10, then print the string “You opened the lock.” Otherwise, print “You are locked out.”

Test Cases:

```
>>>comboLock(9, 2, 5, 4, 1)
You opened the lock.
>>>comboLock(1, 8, 3, 6, 8)
“You are locked out.”
comboLock(2, 2, 5, 6, 4)
“You are locked out.”
>>>comboLock(9, 8, 7, 8, 10)
"You are locked out."
```

Grading:

superman	8
function takes in a height in inches (2)	
function outputs correct output for all valid inputs (6)	
largest	15
function accepts 3 parameters as floating point numbers (6)	
function returns correct output for all valid inputs (10)	
compliments	15
function accepts parameters as booleans (6)	
function correctly generates output (9)	
leapYear	17
function accepts one parameter (2)	
function correctly calculates if year is leap year (15)	
comboLock	30
correctly accepts five integer parameters (10)	
correctly displays “You opened the lock.” when appropriate (10)	
correctly displays “You are locked out.” when appropriate (10)	
code is well commented	5
submission instructions followed	10
Total	100